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The IRON AGE

ents p. 2 **BUS. ADM. LIBRARY** THE NATIONAL METALWORKING WEEKLY September 1, 1949 SEP 8 1949

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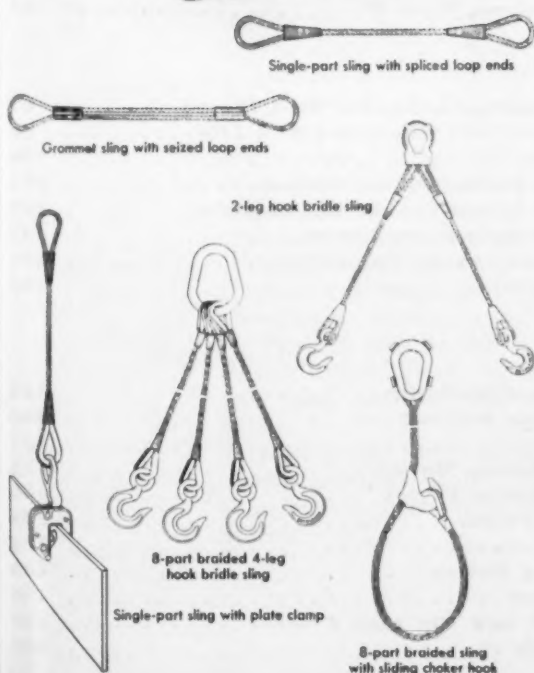
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THE IRON AGE

Editorial

INDUSTRY VIEWPOINTS

Labor's Choice

THIS Labor Day has a special significance to labor leaders. We say leaders because there are and there can be more leaders in that field. Next Monday should be a testimonial to labor's gains. But it also ought to be an inventory-taking pause too.

Labor and its chieftains stand between statism and enlightened free enterprise. It is they who will finally determine if the United States is to retain the world's highest standard of living and its most humane outlook.

What labor does or doesn't do in the next decade will decide which way this country goes. Its choice is dynamite. There is little time to waste. The decision must be made soon.

Instead of chest thumping over what labor ought to get and what it has gotten, its leaders should take a look at industrial history. The Reuthers, the Lewises, the Greens and even the Murrays should review the 1890's and the early 1900's.

One always pays for excesses. There is no way out. If the one responsible doesn't pay through the nose those who come after him will. The early builders of our present industrial system did a good job. But some got too big for their pants. They forgot the human element. They forgot, or never knew, there was a public. They misused power in a lot of ways. They laid the groundwork for trouble.

Managers of industry in the late 20's and the 30's started paying the piper for all management's earlier excesses—real and fancied. They are still paying for them by taxes, interference, controls, governmental nebbiness and political threats. Today's management are not the people who originally sowed the seed for all this anti-business feeling among the public and the government. But they have to take the guff.

Labor now runs to mamma to get help on wage matters that it cannot settle with management. Production has been controlled by labor. And often business has gotten it in the neck because government has supported labor. But there comes a time when obligations have to be paid. Labor's excesses must be paid off the same as those of the early industrialists.

Labor is feeling its oats now. It often acts like the old business barons. It glories in its power. That is its blind spot. As sure as the sun sets the government sometime will come around with its bill.

The bill will be the same dose for labor as was dealt out to business—maybe worse. Then we will be well on our road to statism. Government will be so far into business and labor unions that it will "need" to control both.

Now is the time for labor to take stock. Now is the time to realize that management and labor ought to settle their differences without government interference. Business is ready. The choice is up to labor LEADERS of today.

Tom C. Campbell

Editor

Watching production pennies?

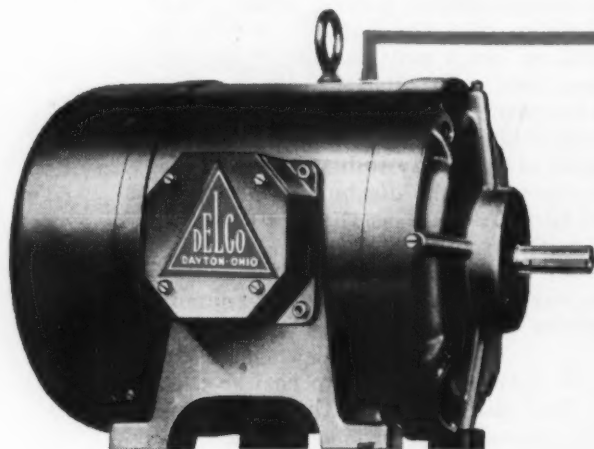


Don't let dollars slip through your fingers!

You hear the same story everywhere. Management has laid down the law: "Get the price down per unit. Cut costs. Take out every penny you can."

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NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

► The day when the great Labrador iron ore find will be exploited is getting a little closer. U. S. Steel and Bethlehem are interested. Within the past few weeks engineers of four smaller steel firms inspected the find where 325 million tons of 59-pct ore were proven in the last year. Another steel company also had a party in the area. However, no papers have been signed yet which might permit a start on the \$200 million program needed to get out the ore.

► Government decontrol of tin will not result in any immediate price change. It will be some time before private imports of high grade metal start coming into the country. And for some time the British Ministry of Supply will be in a position to control the market at its present level.

► Makers of galvanized sheets are worried about loss of markets to aluminum which captured a nice share of the farm business during the extreme steel shortage. There is still no sign that galvanized sheets will be plentiful soon, though new galvanizing lines have come in recently. Automobile industry pressure for flat-rolled products keeps galvanized tight.

► Consensus in Washington now is that the freight absorption bill may not become law during this session of Congress, even with amendments. The big obstacle to its passage has been inability of Senate and House to agree on its final form.

► For several months U. S. Steel had a topnotch railroad man working on its Venezuelan ore strike. He made a study to determine cost and feasibility of running a line from Ceres Bolivar, a virtual mountain of 69-pct iron ore, to the delta on the coast. Flash floods that rise 3 ft in as many hours will be a construction hazard. The project may be 5 years or more away.

► Quenching of air hardening tool steels up to 2-in. thick is now being done by means of forced convection of a cooled protective atmosphere. This bright hardening is done in a new furnace which consists of the preheat, high heat and quench zones, all built into a single L-shaped unit.

► While the steel industry put on a fine presentation before the fact-finding board it does not follow that all steel men agreed on all of the procedure. Smaller companies would rather have had a separate hearing. Some officials of larger companies were not in favor of the attack on the principle of the board and on the President; many others felt that this was the time to speak up. In short, there was more independence of action than the industry is generally credited with.

► The Military has done a little experimenting with powdered aluminum as an aircraft fuel. The theory is that it might be $2\frac{1}{2}$ times as effective as an equal amount of gasoline and could double or quadruple the range of jet planes.

► Steel people do not expect the price structure to break wide open soon—at least not until the ingot rate goes lower than it did in July, when the average was about 71 pct of capacity. But no one will bet on anything—up or down—until the labor problem is thoroughly cleared up.

► Makers of waterworks equipment have an eye on the long-range possibilities of the California market. The area is looking for more water to sustain the industries that must be developed to support a larger population.

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SEPTEMBER 26 MONDAY

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Steel Output Beats Expectations

Scrap Stages Year's Biggest Gain

Sheet Steel Quotas May Return

The Iron Age

SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE steel industry has just amazed itself by making at least 600,000 tons more steel in August than its most optimistic executives thought possible. The pickup has now carried on too long to be called a flash in the pan, strike-hedging or any of the other labels that were tacked onto it a month ago. Buyer fear of a steel tieup certainly played a part in boosting steel order backlogs. But much of the business now on steel mill books represents a return to normal buying patterns.

During the past week several top steel executives privately admitted that they were wrong in laying the upswing entirely to strike fears. They can't be blamed for a bad guess—they based it on customer pessimism. Buyer gloom was so heavy in June that many steel executives could see nothing better than a 75-pct operating rate for August. In Pittsburgh they were talking about a 70-pct rate for the industry based on cancellations and just plain lack of orders. Smaller steel firms were either in the red ink or approaching it so fast that they freely predicted they would buy it by the gallon.

Strike Would Wreck Steel Revival

A strike in steel, autos or coal could wreck the forecast but if they can all be avoided steel's prospects look good. October promises to repeat its normal seasonal strength. In the past week or so several steel market forecasters have put their crying towels in storage, figuring that they won't need them for some time.

Steelmaking scrap prices shot up again this week although steel mills have not yet come into the open market for big tonnages. However, their bids on industrial lists are up sharply and many a broker is losing several dollars a ton to cover old lower-priced orders. **THE IRON AGE** steel scrap composite moved up again this week to \$23.33 per gross ton, \$1.41 above last week's figure, for the biggest jump of the year.

Some 4 months ago steel sales officials felt that it would be September before anyone could tell how important inventory cuts were in the buying collapse that began this spring. Now they have

their answer. They played a big part—though not all of it. The appliance business had hit the skids and freight car building was headed for an open switch; construction jobs were being deferred, refinery programs had been practically completed and the people who made things out of mechanical tubing were shutting down right and left.

Appliance Output Continues To Gain

Some of these lines have now picked up enough to stimulate overall steel demand. Appliance production continues to improve across the board and Detroiters don't look for a drop in automotive steel demand until November. Farm equipment makers expect a good fourth quarter and a nice volume next year at 5 to 7 pct below current levels. Construction has picked up so sharply that some mills are now a month behind on delivery of structural shapes. Mechanical tubing sales are better but there is no chance of a return to 1948 levels. However, railroad steel went through an open switch and it will be some time before the wreckage can be cleared.

Allocations are due if cold-rolled sheets, now on at least a 2-month delivery basis, get any tighter. Some mills never got away from a customer quota system to assure fair distribution though it was not needed for several months. They are watching it now to see that shipment promises don't get out of hand. Galvanized sheets are still on a quota basis and are getting tighter due in part to the Federal corn storage program. Some corn cribs, scheduled for completion before the fall harvest, will not be ready on time. Major mills are now just about booked through December on galvanized sheets.

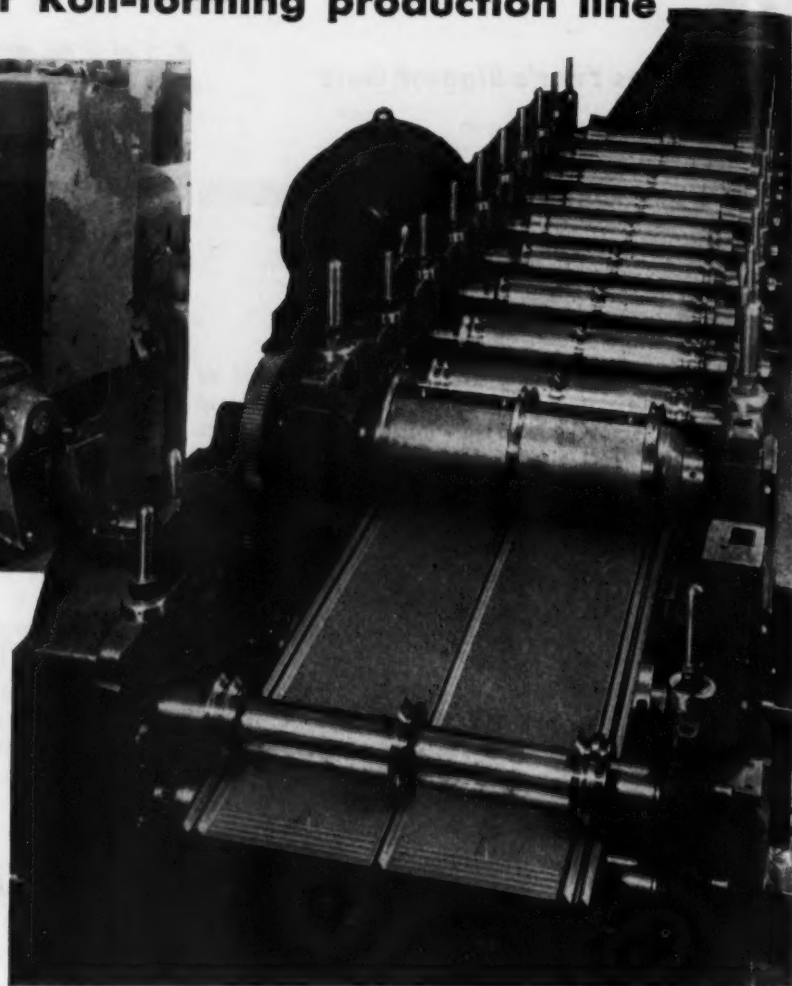
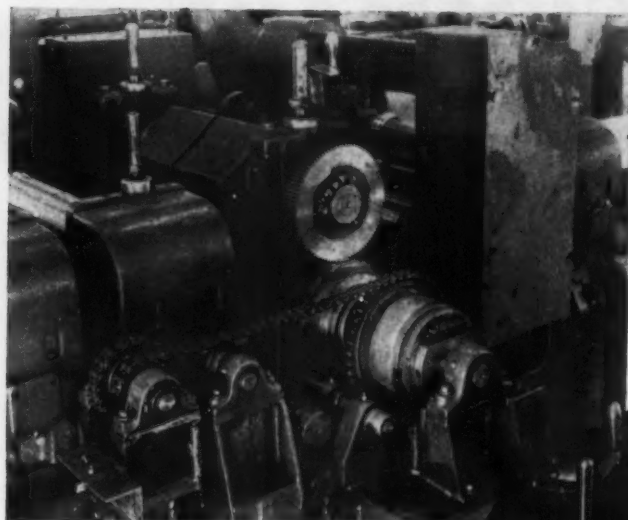
Steelmaking Rate Rises 1.5 Points

Continuing a trend unchecked for 9 weeks in a row, steel ingot operations for this week were scheduled at 86.5 pct of rated capacity. This is a gain of 1.5 points over last week and is 24.5 points better than the low point reached during the July Fourth week.

12

Examples of Economies Effected

by combining different operations in a
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5 Longitudinal
NO. forming; cross-
crimping of ends;
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consecutive numbering
of each panel

These various operations are performed in a single pass through this Yoder roll forming machine. The imprinting and numbering device is mounted between two roll stands and is chain-driven from the regular transmission turning the rolls, as shown in inset at left.

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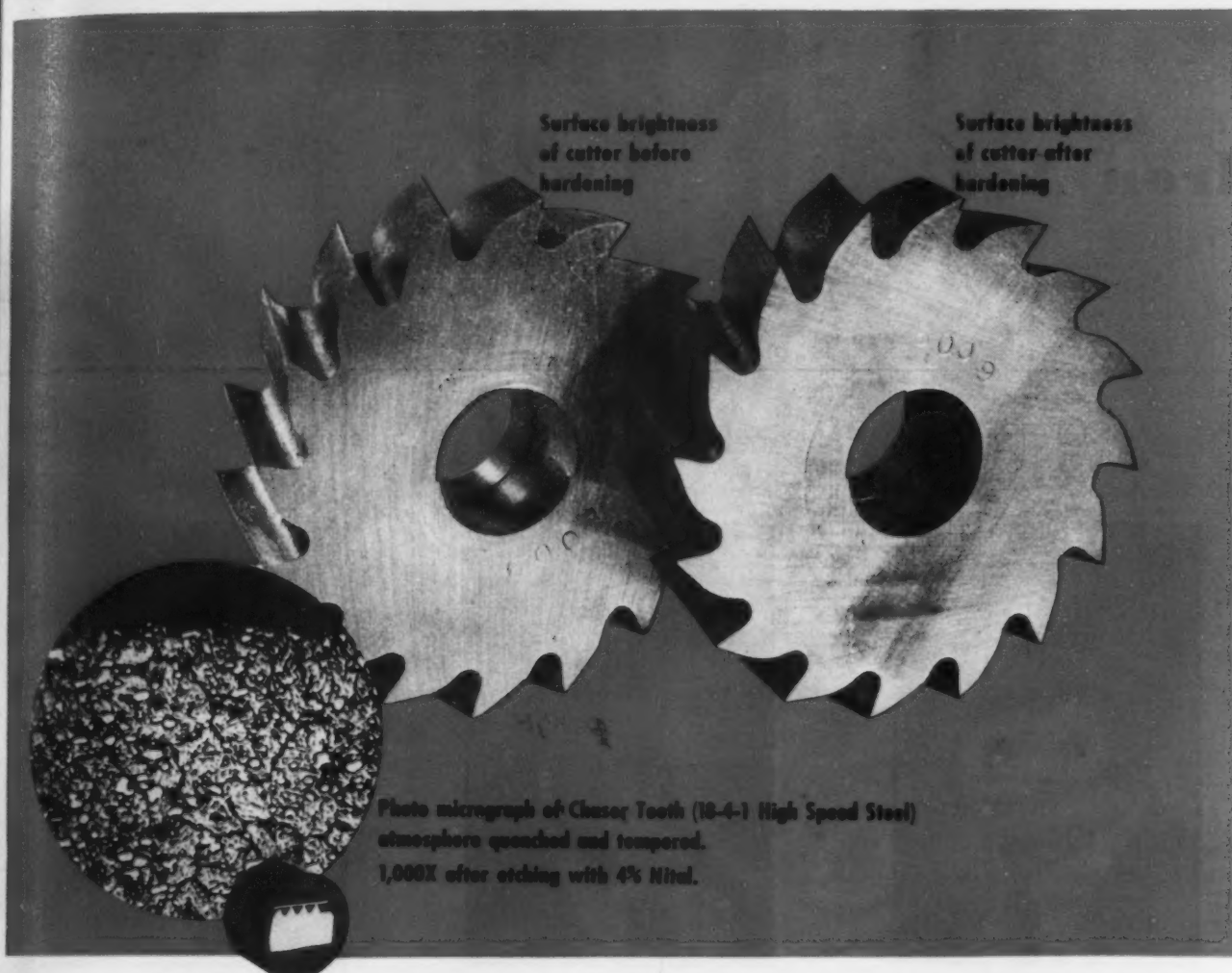
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FURNACES

Iron Age

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W. M. KELLEY, vice-president in charge of operations, Republic Steel Corp.



EARL M. RICHARDS, vice-president in charge of planning & development, Republic Steel Corp.



PETER ROBERTSON, assistant vice-president in charge of operations, Republic Steel Corp.

Earl M. Richards is the new vice-president in charge of planning and development at REPUBLIC STEEL CORP., Cleveland, having previously risen to the post of vice-president in charge of operations. He entered the corporation shortly after its organization as chief industrial engineer. W. M. Kelley has been elected to succeed Earl M. Richards as vice-president in charge of operations at REPUBLIC STEEL CORP. Mr. Kelley has for the past four years directed the manufacturing divisions of the corporation. He joined Republic in 1936 as works manager of the Youngstown plant of the subsidiary Truscon Steel Co. Peter Robertson has become assistant vice-president in charge of operations in the manufacturing divisions of REPUBLIC STEEL CORP., Cleveland. He was formerly works manager of the Youngstown plant of Truscon Steel Co., a Republic subsidiary.

Richard Harte was recently elected a director of NATIONAL STEEL CORP., Pittsburgh. He is president of Ames Baldwin Wyoming Co., Parkersburg, W. Va. and a director of Baltimore & Ohio Railroad and of Chicago, Wilmington & Franklin Coal Co.

Stanley J. Retzlaff has rejoined ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, as manager of sales to machinery manufacturers. After progressing to the post of director of trade relations at Allis-Chalmers, Mr. Retzlaff left to become vice-president of Industrial Mills Inc., in 1948.

Elden T. Davis has been appointed comptroller and assistant secretary of CLEVELAND CHAIN & MFG. CO., Cleveland, and its associated concerns.

Cameron Baird has been elected chairman of the board of the BUFFALO PIPE & FOUNDRY CORP., Buffalo. His brother, William C. Baird, succeeds him as president and will also continue to discharge his previous duties as treasurer.

Robert N. Page has been made assistant director of public relations of REYNOLDS METALS CO., Louisville, where he had edited the employee publication since 1946. S. L. Manning has been appointed by the company as assistant product manager for their wire, rod, bar, structural and cable division.

S. Ray Wallace has been transferred to the Special Products Division of U. S. PIPE & FOUNDRY CO., Burlington, N. J. He acted as sales engineer, Special Machinery Division, until his recent promotion.



W. A. BROWN, JR., vice-president and general manager, Liquid Carbonic Corp.



E. T. WARREN, vice-president, Tata Inc. at New York



GEORGE PERRAULT, JR., sales manager, Rolling Mill Division, E. W. Bliss Co.

W. A. Brown, Jr., is now vice-president and general manager of **LIQUID CARBONIC CORP.**, Chicago. He served previously as vice-president of the Compressed Gas Division at New York.

E. T. Warren has been appointed vice-president of **TATA INC.**, New York City. Mr. Warren has recently returned from India, where he was assistant general superintendent of the Tata Iron and Steel Co., Ltd. at Jamshedpur.

R. A. Emmett, Jr. has been made special assistant to the general manager and **J. Doyle Hamacher** has been appointed superintendent of the Equipment Manufacturing Plant, **DETREX CORP.**, Detroit. **George W. Pew** will head the newly created Process Engineering Department. **D. E. Williard** is manager of industrial cleaning equipment and chemical sales for the Central Region of the United States. **W. H. Webb** has been placed in charge of the alkali emulsion phases of sales, service and consultation for that region. **Alan Harris**, who has done field development work in cleaning compounds, will serve the metal industry in the Detroit area.

Fred T. Miller and **R. A. Stumm, Jr.** have been elected vice-presidents of **ADEL PRECISION PRODUCTS CORP.**, Burbank, Calif. Mr. Miller, previously the firm's general sales manager, has been appointed vice-president in charge of engineering and sales. Mr. Stumm, previously assistant to the president, has been made vice-president in charge of manufacturing.

George Perrault, Jr. has been appointed sales manager of the Rolling Mill Division of **E. W. BLISS CO.**, Salem, Ohio. Mr. Perrault was formerly sales and advertising manager of the Salem Engineering Co.

Frank Ross, national manager of lubrication for **E. F. HOUGHTON & CO.**, Philadelphia, has been named to the newly-created post of assistant to the vice-president, Sales. **A. C. Smith**, former assistant to the Eastern Sales manager, has been promoted to the newly created post of sales co-ordinator for the two eastern sections, North and South. **Orum R. Kerst** will head the North section, and **J. R. Clendenning** will direct the South section.

K. D. Busbee is southwestern district representative of **OLIVER IRON & STEEL CORP.**, Pittsburgh, pole line sales division. Mr. Busbee will make his headquarters at Dallas, and will report to the corporation's southern sales headquarters at Birmingham.

Howard B. Downs has been promoted to general sales manager at **SOLVENTOL CHEMICAL PRODUCTS**, Detroit. He had served as advertising director of the firm.

Walter H. Rothschild has been appointed by **THE STANLEY WORKS**, New Britain, Conn., as export representative.

Earl Roberts is made sales engineer with the Memphis Branch of **BLACK & DECKER MANUFACTURING CO.**, Towson, Md. Mr. Roberts has previously been with the Service Department. **David Rolston** has joined Black & Decker as Home-Utility Sales representative in the Philadelphia territory.

William Townsen, long associated with **PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.**, Philadelphia, as sales manager, has been named vice-president in charge of sales.

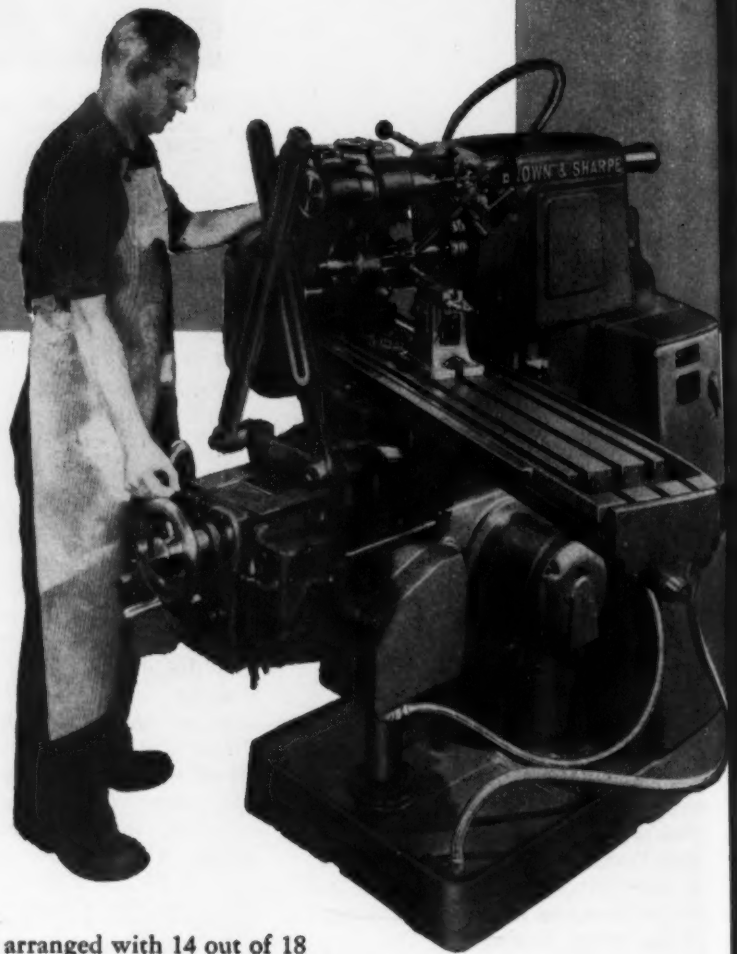
George Roberts, former assistant sales manager for the **BIRMINGHAM TANK CO.**, Birmingham, has become sales manager.

M. G. Holmes has been elected treasurer of **CHICAGO MALLEABLE CASTING CO.** and **Allied Steel Castings Co.**, Chicago.

Turn to Page 108

Get these extra advantages of *Extended Spindle Face* design

**EXCLUSIVE IN BROWN & SHARPE
3 AND 5 H.P. UNIVERSAL
AND PLAIN MILLING MACHINES**



FIVE *important milling advantages, results of the Extended Spindle Face design, are illustrated on the opposite page. Each represents a distinct saving in time, in manpower, in cutter costs, or in equipment. All offer exclusive, timely ways to boost the efficiency of your milling operations.*

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produced under
laboratory supervision



Rigidly controlled and tested during manufacture . . . and produced from the finest lime and coke available, "National Carbide" (meeting all Federal Specifications) assures every customer an exceptionally high acetylene yield per pound of carbide — a minimum $4\frac{1}{2}$ cu. ft. This high quality, plus careful adherence to a special packaging technique accounts for "National's" wide acceptance as the Carbide producing maximum acetylene production . . . at lowest operating cost.

Also, and of vital importance to you, no matter where your plant is located, "National Carbide" can be obtained in any quantity from a nearby Airco office, authorized dealer, or warehouse.

For more information about this top-grade product, write your name and address on the margin below,

and send it to your nearest Airco office or authorized dealer for a copy of Catalog 30.

★ ★ ★

Air Reduction supplies Oxygen, Acetylene and other industrial gases . . . Carbide . . . and a complete line of gas cutting machines, gas welding apparatus and supplies, plus arc welders, electrodes and accessories. Ask us about anything pertaining to gas welding and cutting, and arc welding . . . we'll be glad to help you.

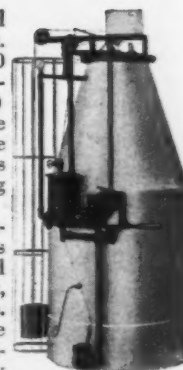
More news about
AIRCO products

STATIONARY ACETYLENE GENERATORS

Airco's 300 pound (double rated — 600 cu. ft. per hr.) and 500 pound (double rated — 1,000 cu. ft. per hr.) stationary acetylene generators are suitable for operating all types of welding or cutting torches.

Automatic in principle, these generators feature hot galvanized shells — inside and out, with all welded seams. Operating parts have been reduced to a minimum — and are easily accessible for inspection or repair.

Also included as standard equipment are "protectomotor filters" to entrap suspended lime, and prevent clogging acetylene pipe lines, regulators and torches.



PORTABLE ACETYLENE GENERATORS



The Airco Type "P" portable acetylene generator is designed and constructed for efficiency, convenience, dependable and low-cost operation . . . and requires little attention other than draining and refilling with carbide and fresh water. Other features include:

- Quick, easy charging
- "Air Lift" principle of water circulation
- Glass viewing window in carbide hopper
- Simple and conveniently located controls
- Large-size sludge agitator and valve for complete and fast sludge removal.

Made in three sizes, each approved for double-rated operation: 15-lb. size, 30 cu. ft. per hr.; 30-lb. size, 60 cu. ft. per hr.; and 50-lb. size, 100 cu. ft. per hr.

All Airco generators conform with the specifications of Underwriters' Laboratories and Factory Mutual.



AIR REDUCTION

Offices in Principal Cities

GLOBAL LETTER

REVIEW OF WORLD MARKETS

Federation of British Industries urges more production and fewer controls . . . July steel output slipped sharply in Belgium and Luxembourg . . . Export orders slow up.

London—The Federation of British Industries, representing all manufacturers, has just issued a statement on the economic crisis. It declares bluntly that there can be no escape from the hard logic that the standards of living of the British people, including social services, must be cut according to the cloth they can make from now on.

The "vast and menacing" increase in State expenditure, says the federation, is the basic inflationary influence in the British economy. It bears most heavily upon production costs. It is also one of the most serious handicaps to the future of British trade and to the living standards and employment of the people.

What the federation has to say about the need for increased productivity underlines the exhortations of ministers. To that extent it should please the government. Its hard-hitting on State expenditure won't prove so popular. Publication of the report has already been described in sections of the left-wing press as stick waving by big business.

The federation is gravely concerned at the inadequate appreciation of the economic situation. Now

that we have passed from the sellers' market, the dangers of living beyond one's means, with its corollary of high and crippling taxation, will be felt.

Urges More Production

Britain must pay her way. This depends on productive industry, supported by the trading and other services that earn invisible exports. Therefore, there is the strongest necessity to give every encouragement to it.

In the competitive conditions which are more and more to be expected it is essential that every help be given to reducing costs of exports. This means that taxation, and therefore government expenditure, must come down.

At present the tax collector takes 40¢ out of every dollar that the nation produces. Profits are taxed even more heavily than this, and no opportunity is left to create adequate reserves.

Controls Could Be Lifted

"It is little wonder if companies—or individuals—feel little inducement to take risks which the situation demands. High taxation is a direct cause of high costs. It also means that the rigidity of the plan-

ning of our economic life should be relaxed.

"Controls have undoubtedly been reduced in number. But more could be abandoned. Price mechanism will, as it has in the past, apply the necessary correctives. The spur of competition is still the most effective aid to efficiency. It means, too, that we must face the fact that as a nation we must work harder without increasing costs of production."

Everyone engaged in industry must strain every nerve to cheapen methods of production, to abandon restrictive practices and to adopt all possible aids to increased productivity. The federation says this is a program that will demand effort and sacrifice from all. But that no solution can be found without it.

Steel Output Drops Sharply In Belgium and Luxembourg

Brussels — The sharp drop of steel output in Belgium and Luxembourg in July was partly the result of seasonal factors, including holidays. But the fall has been much sharper than expected.

Preliminary figures indicate that total production of the two countries amounted to 472,293 metric tons (Belgium 285,000 and Luxembourg 187,983) in July. This compares with a monthly average of 579,000 tons for both countries during the first 6 months of the year and a peak of 670,000 tons in March. In both countries the declining trend seems well established and latest reports give no hope for

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AGE



Two views of a steel mill table roll body cast of Meehanite Metal by the Shenango-Penn Centrifugal process, assuring exceptional life. Note exterior and interior machining. Shenango-Penn facilities include modern equipment for economical machine work of virtually every type and to any stage to best meet your particular needs.

Maybe you can profit by steel mill experience

THIS conveyor roll is going to save a steel mill some money. Because it is a Shenango-Penn *centrifugal* casting of Meehanite Metal, it will hold up longer than an ordinary roll . . . won't need replacement nearly so soon! That's good economy, don't you think?

Fundamentally that's why Shenango-Penn is producing symmetrical, annular and tubular parts, large and small, ferrous and non-ferrous, for many services in many industries. The Shenango-Penn *centrifugal* casting process results in more

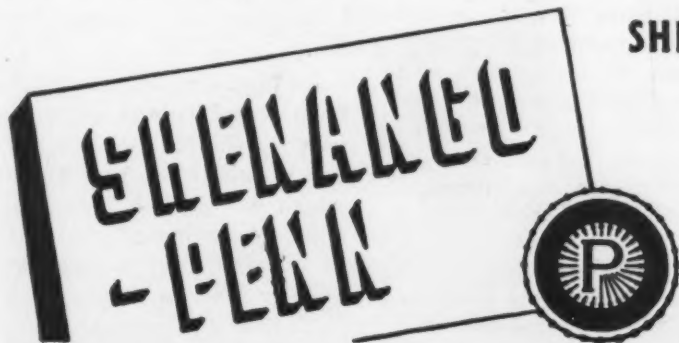
uniform, pressure-dense parts with finer grain, greater strength, superior wear resistance and freedom from sand inclusions and blow holes. Metal for metal, dollar for dollar, they do a better job. It pays!

As always, we welcome the chance to give you further evidence, specific facts, as to why it will pay *you* to specify Shenango-Penn. Send for a free bulletin on our ferrous or non-ferrous made-to-order centrifugal castings or on our *centrifugally cast* bronze bushing stock in standard sizes.

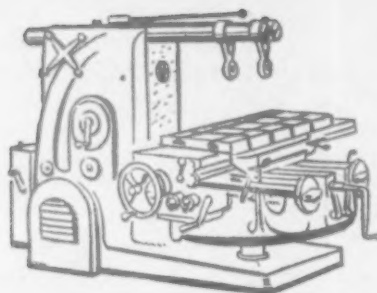
SHENANGO-PENN MOLD COMPANY

577 West Third Street • Dover, Ohio

Executive Offices: Pittsburgh, Pa.



**ALL BRONZES • MONEL METAL
NI-RESIST • MEEHANITE METAL**



MACHINE TOOL

High Spots

SALES, INQUIRIES

AND PRODUCTION

Cleveland—This week more than one sales executive was voicing the opinion that the machine tool business, apart from a moderate pick-up this fall, will be nothing to write home about for some months to come.

A mid-western machine tool company sales executive put it like this—"It seems to me when you look at it carefully, the machine tool industry is in for a period of quiet business. And for the long pull, the trend is down."

The machine tool industry is greatly expanded, which is no news to anybody. But the postwar expansion of the industries using large numbers of machine tools is over. Therefore, many machine tool builders have the problem of making a profit on substantially lower volume in expanded plants.

Replacement Not In Sight

The obvious panacea for the machine tool industry's problems is a large scale replacement program by its customers. This is not in sight at present.

A negative factor in any long term appraisal is war surplus machine tools. Many of these are reposing for the time being in JANMAT, some are still on lease, and some are in the hands of



by

William A. Lloyd

Machine tool executives say that outlook is not good . . . Big orders for replacement not in sight.

dealers, who, bought them for peanuts. This surplus will probably be with the industry for the next 10 years.

A machine tool company checked up recently and found, on the basis of sales reported, that about 225 of their machines were sold during the first 6 months of 1949. Dealers sold about 150 of these used machines. The rest were reported as coming from government surplus.

Buys JANMAT Tools

In the same period, the company sold about 250 new machines. But

during the 6-month period the company quoted on a job that looked to be a nice piece of business only to have the company quoted fill its requirements from the JANMAT reserve.

The used machine total during the 6-month period is only the number reported. The actual number sold is probably higher.

Sells War Surplus Tools

Machine tool sales and auctions are still rather numerous, although fewer than during the wild and woolly heyday of WAA. What seems to be under way is a second liquidation of war surplus machine tools. This may come at a time even less convenient for the machine tool builders than the first.

New order volume was at low ebb in most market areas this week. In the east one company reported August as the worst month yet—even lower than July. Another company laid off 500 workers and will remain closed for an additional 2 weeks. Practically everywhere else, the anticipated fall pickup was being pushed back to the end of September.

Post-Mortem on July

A post-mortem on July machine tool orders and shipments reveals the rather bleak effect of plant vacation periods. Orders and shipments dropped to new postwar lows in July.

According to a preliminary report by National Machine Tool Builders Assn., July shipments dropped to an index figure of 60.8 from 79 in June and 62.4 in July, 1948. New orders declined to 48 from 53.6 in June and 74 in July, 1948.

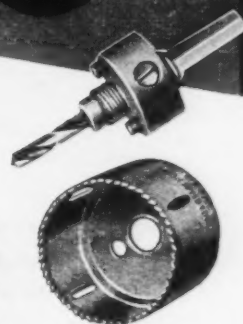
NMTBA's index is based on average annual shipments for 1945 through 1947.

Ratio of unfilled orders to shipments for July was 4.4 to 1, compared to 3.5 to 1 in June and 5.9 to 1 in July, 1948. Foreign orders, which are included in the new order total, dropped to an index of 14.2 from 15.7 in June, but up slightly from an index of 13.3 in July, 1948.

Cut...

LARGE HOLES

... thru any machineable material up to **ONE INCH** thick!



Here is a premium tool which makes it possible to saw holes in one short operation ... large holes which heretofore had to be laboriously machined "a-chip-at-a-time."

MARVEL High-Speed-Edge Hole Saws have strength to withstand the terrific peripheral strains of heavy duty operation in lathes, drill presses or portable power tools. They have a high speed steel cutting edge which is electrically welded to a tough, alloy steel body, high speed steel pilot drills, heavy hexagonal shanked arbors and sufficient set for deep drilling. They are self-aligning, as the larger diameter saws float on their arbors and are driven by double drive pins. They will saw round holes accurately in any machineable material.

MARVEL High Speed-Edge Hole Saws come in 35 sizes, from $\frac{3}{8}$ " to $4\frac{1}{2}$ ". They are carried in stock by leading industrial distributors.

WRITE FOR BULLETIN ST-49

"MARVEL" has Always had the edge!

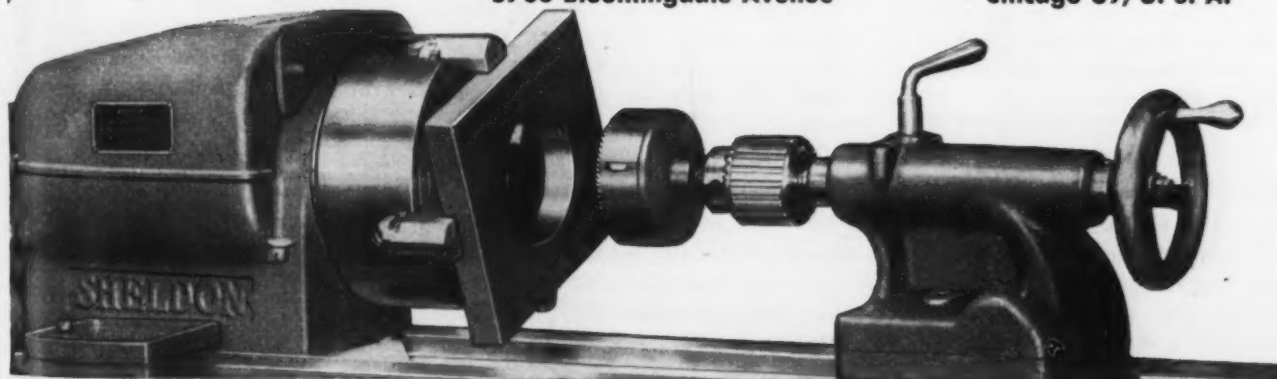


ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Avenue

Chicago 39, U. S. A.



September 1, 1949

FREE

USE THIS POST CARD

PUBLICATIONS

Distribution Transformers

Bulletin TU-180 contains descriptive listing of various distribution transformers. Included are sections on engineering data and installation and operation instructions. *Wagner Electric Corp.* For more information check No. 1 on the postcard.

Materials Handling

Materials handling equipment for use with lift trucks is featured in bulletin No. 600. Described are lift truck platforms, tote boxes and pans, pallets and special design equipment. *Powell Pressed Steel Co.* For more information, check No. 2 on the postcard.

Silicone Greases

Bulletins No. D-5 and D-6 give properties, performance and uses of heat stable, oxidation resistant silicone lubricants. Included are instructions for lubricating open and shielded bearings of electric motors. *Dow Corning Corp.* For more information, check No. 3 on the postcard.

Safety Equipment

Safety clothing and equipment for every type of industrial worker are described in catalog No. 50. Listed are respirators, blankets, clothing, body guards, safety belts,

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

stretchers, first aid kits, safety lamps, and fire extinguishers. *Safety Clothing & Equipment Co.* For more information, check No. 4 on the postcard.

Lead Anodes

Bulletin No. 804 describes corrugated lead anodes, which have greater surface area which results in increased plating efficiency. Anodes are V-shaped with knife edges. *Belke Mfg. Co.* For more information, check No. 5 on the postcard.

Paving Breaker

Bulletin describes paving breaker and tells how line air pressure is utilized to lift the 80 lb class breaker and to free stuck steels. *Le Roi Co.* For more information, check No. 6 on the postcard.

Corrosion Resistance

Corrosion resistance of stainless, monel and nickel castings are covered in a comprehensive data sheet for materials engineers in selection of alloys for known corrosive

agents and conditions. *Cooper Alloy Foundry Co.* For more information, check No. 7 on the postcard.

Enclosed Motors

Bulletin describes line of enclosed electric motors and contains discussion of temperature effects. Features include asbestos protected windings, drip-proof housing, novel lubrication system, normalized castings, cyclone ventilation, centricast rotor, and annealed laminations. *U. S. Electrical Motors, Inc.* For more information, check No. 8 on the postcard.

Heavy Equipment

Construction and industrial equipment—new, used and rebuilt—is listed in catalog which also describes services and shop facilities available. *W. T. Walsh Equipment Co.* For more information, check No. 9 on the postcard.

Sheet and Plate

Corrosion resisting sheet and plate of a new low carbon, austenitic stainless steel is described

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Four typical machine shops report

"LONGER TOOL LIFE"

"BETTER FINISH"

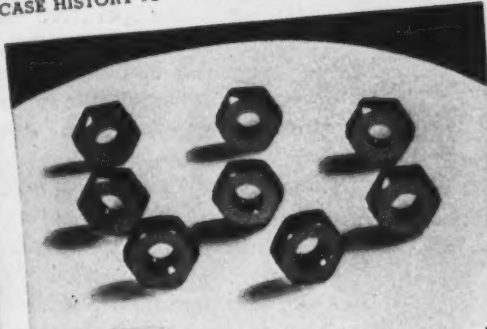
"FASTER OPERATION"

WITH NEW

J&L FREE-CUTTING "E" STEEL

J&L STEEL

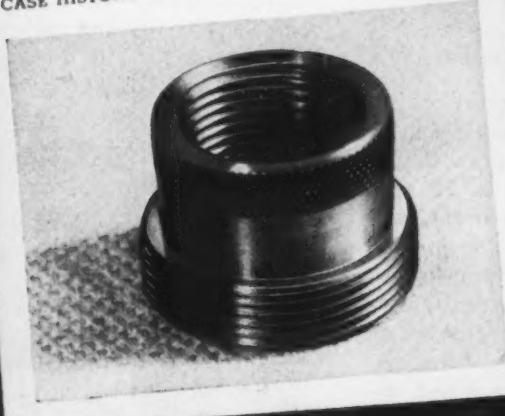
CASE HISTORY #1



CASE HISTORY #2



CASE HISTORY #3



CASE HISTORY #4



Four typical examples, taken from 100 case histories, show superior machinability of J&L "E" Steel.

For 4 years before "E" Steel was publicly announced, this new, free-cutting bessemer screw stock was tried by independent machine shops throughout the metal-working industry.

More than 6,100 tons were tested in over 100 applications!

Here are quotations from 4 typical case histories:

CASE HISTORY #1 "... tool life increased 100% at normal speeds ... better finish ... shop people liked it."

CASE HISTORY #2 "... tool life increased up to 200% ... uniformity of finish

remained constant ... considerably increased speeds without sacrifice to finish."

CASE HISTORY #3 "... tool life increased two to four times ... we were able to tap 1" full internal pipe thread, almost impossible on regular material."

CASE HISTORY #4 "... new steel machines very well ... finish excellent ... tool life increased ... 5 to 10% better production."

You too can get greater economies in your machining operations with new J&L free-cutting "E" Steel. "E" Steel is available in three grades: E-15, E-23 and E-33, each within the composition limits of the stand-

ard bessemer screw steels and with similar tensile properties. All standard sizes and shapes are available. For further information write for your copy of our new booklet: "J&L 'E' Steel."

Jones & Laughlin Steel Corporation
403 Jones & Laughlin Building
Pittsburgh 19, Penna.

Please send me a copy of "J&L 'E' Steel."

Name _____

Company _____

Address _____

JONES & LAUGHLIN STEEL CORPORATION



* "E" STEEL IS QUALITY-CONTROLLED FROM OUR OWN MINES THROUGH THE FINISHED PRODUCT

NEW

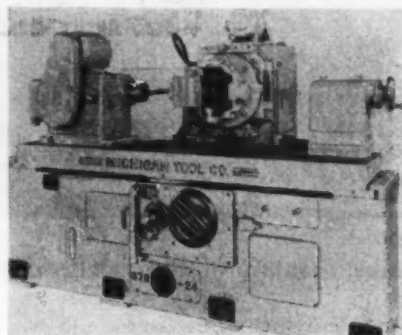
PRODUCTION IDEAS

Continued

motors. The new control is intended for use on whirley, revolver, gantry and overhead cranes. It provides power hoisting and dynamic lowering. The change is inherent in the control and is independent of the operator or any particular control device. When decelerating the speed is reduced automatically before the solenoid brake sets. Both overshoot and down drift are eliminated. *General Electric Co.* For more information, check No. 21 on the postcard on p. 35.

Gear Finisher

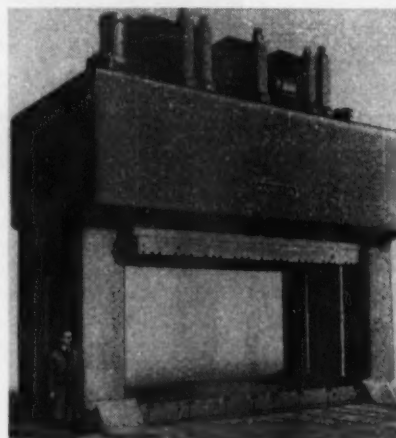
Spur or helical gears and involute splines from zero to 18 or 24 in. diam and up to 15 in. face width can be handled on a high production crossed-axis rotary gear finisher. The entire operation is automatic once the machine is set up for a given gear type and the gear



has been loaded between centers. Gears may be shaved by underpass, transverse, or traverpass methods. Wide face and narrower gears can be curve-shaved while being finished with any of the three methods. All controls are located at the front of the machine. Faster cutting is possible because of a rapid approach feed in the machine cycle, and automatic in-and-return feed. A special interchangeable cutter head provides for finishing internal gears. Operation can be performed by unskilled or semi-skilled workmen. *Michigan Tool Co.* For more information, check No. 22 on the postcard on p. 35.

Drawing Press

A 75 pct increase in production of automobile roof stampings is said to be achieved with a new



high-speed triple action drawing press. The press can use dies up to 200 in. long, and will draw 24 in. deep. Drawing speed is 70 fpm and the press operates at the rate of six strokes per min. The plunger slide is in the bed and travels upward when making the draw, permitting the stamping to come out of the die right side up. Smaller presses for drawing outer and inner car door panels will operate at 16 strokes per min. Sheet steel can be automatically unwound from the coil and fed into the door presses, which in turn will simultaneously blank and draw. Subsequent operations can also be mechanized. *Lima-Hamilton Corp.* For more information, check No. 23 on the postcard on p. 35.

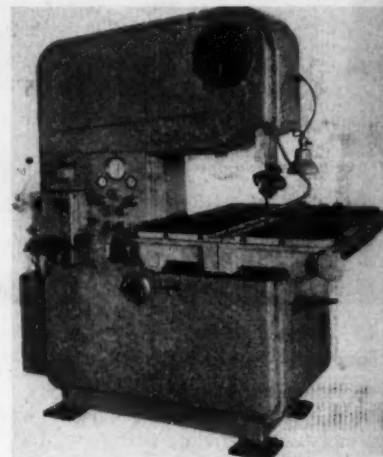
Tool Set

For industrial maintenance, providing tools for trouble-shooting and reducing time in breakdowns, a 68-piece Proto master tool set includes nine feeler gages and a holder; four punches and a chisel in a flexible kit; seven combination box and open end wrenches with $\frac{3}{8}$ to $\frac{3}{4}$ in. openings, in a kit; four tap-pet wrenches in a kit; seven socket wrenches and six handles and attachments for $\frac{3}{8}$ in. drive; 19

socket wrenches and six handles and attachments for $\frac{1}{2}$ in. drive, and a $20\frac{1}{2}$ x $11\frac{1}{2}$ x 9 in. tool chest with three trays. *Plomb Tool Co.* For more information, check No. 24 on the postcard on p. 35.

Manufacturing Machine

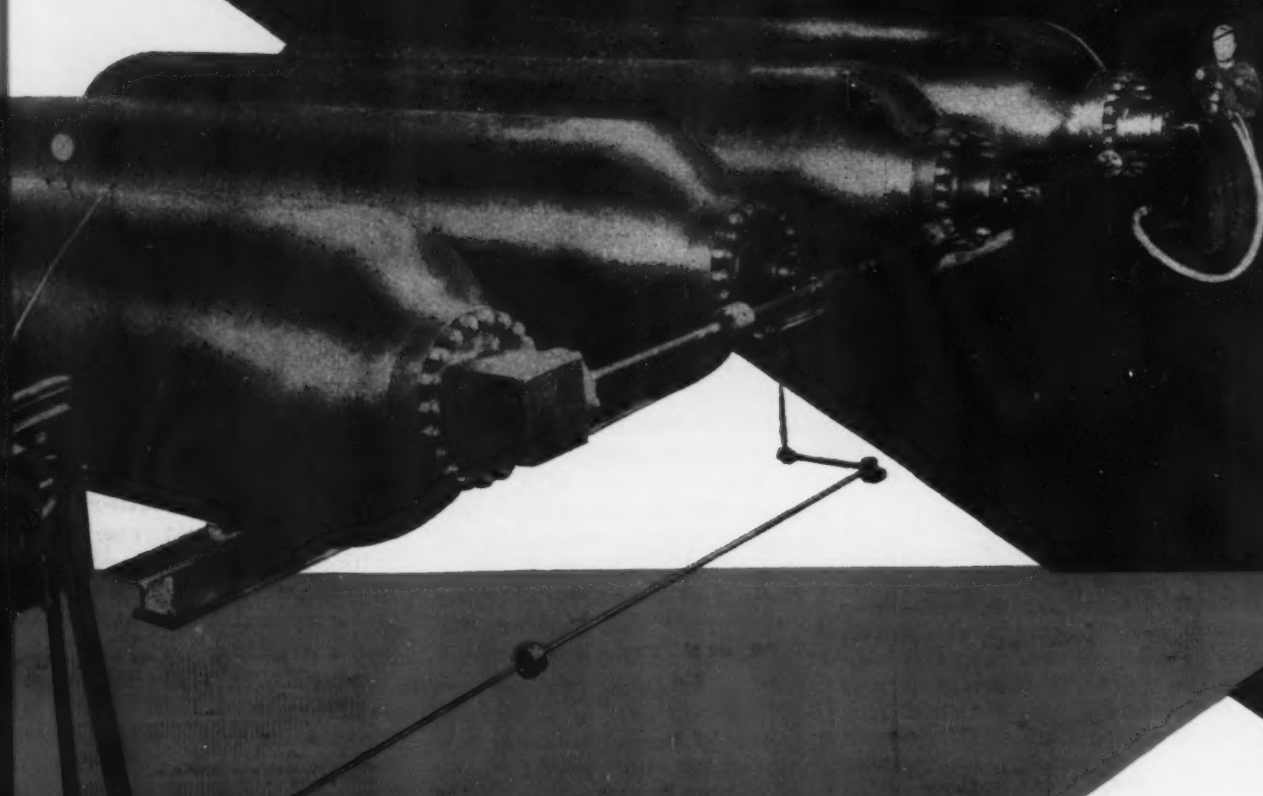
Fast precision cutting of solid materials can be performed on a new semi-automatic hydraulically controlled machine tool through a repetitive production cycle controlled by the operator. Called the DoAll Contour-matic, the machine employs an endless band of teeth to slice through the material removing it in sections. It has a 20-in. throat and 12-in. thickness capacity. Dial control of hydraulic power is used in operating the machine, that has an infinitely variable and stepless speed range from 40 to 10,000 fpm. Variable hydraulic feeding pressure up to 100 lb is provided. Computation of correct blade velocity, feeding pressure and type of blade to be used is shown on a job selector. In feeding material



into the saw band, pressure and speed of table travel are controlled by the operator through a hydraulic control valve and pressure dial indicator. Built-in equalizing factors provide for adjustments that are interrelated. The work table tilts 45° to right and 10° to left which permits compound beveling operations. It is positioned 39 in. above the floor to minimize operator fatigue. An automatic flash welder located on the machine joins saw bands $\frac{1}{8}$ to 2 in. wide. This welder has a blade shear, grinding wheel, and annealing controls. Band fil-

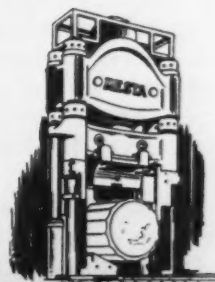
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MESTA forgings



Mesta Forge Shops have unsurpassed facilities for producing the largest forgings, from raw material to finished product, including crankshafts, marine parts, rotor shafts, rolls and pinions, pressure vessels, pump blocks, table rollers, and many others.

The four large, one-piece, steel pressure vessels shown were forged in the Mesta Shops and are being hydrostatically tested.



DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY

PITTSBURGH, PA.

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

Reuther makes strong statements as Ford strike date draws near . . . Unique operating features of Chrysler's new Disc Brake . . . Brake to be shown in September.



by

Walter G. Pottner

Detroit — Negotiations between Ford and UAW continued last week, minus Mr. Reuther's personal attendance, but accomplished nothing important. Ford Motor appears adamant on its refusal to consider UAW demands. Ford has taken the position that should they offer anything it would only constitute a basis for further bargaining which in view of a strike vote and the strike deadline is an empty gesture. Mr. Reuther in addressing 4000 Ford Motor employees over 60 years old last week made some strong statements. He took the position of "we get pensions or else." When the next contract is signed with Ford, Mr. Reuther told the oldsters, "you guys can know exactly to the week when you will be able to retire."

Compromise in offers of settlement appear remote. A compro-

mise on the strike date is also remote as Michigan State law makes no provision by which the union and the company can agree to extend the strike deadline. Legally, if UAW doesn't strike on or before Sept. 13, another vote must be taken and won before the union can walk out at Ford.

Those who have been watching the New York steel hearings for an indication of the results of the fourth round labor demands are now diverting part of their time to watching Detroit as there is a faint chance Mr. Reuther may reach his deadline before the steel case is settled.

Voted for Walkout

Chrysler workers voted 90 pct in favor of a walkout last week in a union-conducted poll. Strike action, however, in this case cannot take place without going through the processes of a strike labor mediation board which in Ford's case has already been done. Meanwhile, the U. S. Bureau of Labor Statistics reported on the Consumer Price Index used for quarterly adjustments of wages by GMC.

The BLS Index came out 168.5 for July 15 and did not change enough to effect any revision in wages for the quarter beginning Sept. 1.

Chrysler's New Brake To Be Shown Publicly in Fall

When Chrysler announced their new disc-type brake 2 weeks ago—a lot of things stopped. First was the conjecture about when the industry would come through with such a brake and second, any further development program on ordinary brakes until the Chrysler self-energizing and self-adjusting product could be studied by other manufacturers. Last week in this column the major characteristics of new brakes was discussed.

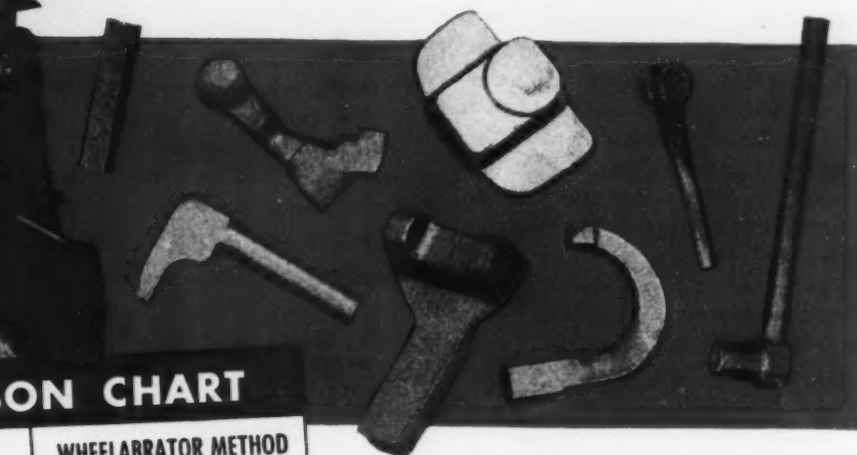
Although disc brakes as such are not new, they are new on automobiles and Chrysler's original approach to design is unique. Two hydraulic cylinders mounted on the inner pressure plate do not push the brake against the housing as might be expected. The hydraulic cylinders merely rotate the aluminum discs, and in so doing the discs climb outward against the housings. This climbing action is due to six balls traveling in ramps of 35° pressure angle machined into the inside surface equidistant around the pressure ring. To provide variable ratio of braking effect between front and rear wheels, 1¼ in. diam cylinders are used on the front brakes and 1 in. diam cylinders are used on the rear brakes. The cast iron



WHEELABRATOR®

cleans 600 tons of forgings
and saves \$7,163.60

at the MONDIE FORGE CO., Inc.
Cleveland, Ohio



COST COMPARISON CHART

MACHINE USED	FORMER METHOD	WHEELABRATOR METHOD
	Tumbling mill and outside job cleaning	Two 20"x27" Wheelabrator Tumbblasts (2½ cu. ft. capacity)
PRODUCTION	50 tons a month	50 tons a month
CLEANING COST	Tumbling \$7.38 per ton. Outside cleaning \$20.00 per ton.	\$5.50 per ton
SAVINGS	SAVING Versus Tumbling . . . \$ 1.86 per ton: Versus Outside Cleaning . . . \$14.48	
	SAVINGS PER YEAR \$7,163.60	

You can benefit from the cost-reducing advantages of Airless Wheelabrator blast cleaning even though your tonnage is small. The Mondie Forge Company, Inc., cleans only a part of their production, amounting to about 600 tons a year. Yet they have saved \$7,163.60 a year since they installed two Wheelabrator Tumbblasts in 1946, each having a 2½ cubic foot capacity. Before that time, forgings were cleaned in a tumbling mill and by outside job cleaners. Shipping deadlines were missed, cleaning and handling costs were excessive, cleaning standards were poor, the tumbling process was too slow and rejects were too high.

The Wheelabrator Tumbblasts have paid their cost over and over again as they corrected these faults with their fast, thorough cleaning.

Whether your cleaning operation is large or small, there is a Wheelabrator Machine that will handle your job right. That is why the story's always the same: WHEELABRATOR PAYS ITS WAY BY REDUCING BLAST CLEANING COSTS.



New, informative book gives complete, concise information on all phases of airless blast cleaning. Write today for Catalog No. 74-A.



American
WHEELABRATOR & EQUIPMENT CORP.
510 S. Ryker St., Mishawaka 3, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

September 1, 1949

brake housing, which provides two machined flat braking surfaces for the two aluminum pressure plates is assembled in two halves. These are bolted together at their circumference, and the wheel is bolted to the outer housing.

To Be Shown in September

The public will get its first look at the new brake on the Chrysler Crown Imperial model which will come in September. Like most brakes there is little to see from the outside but when the salesman in the showroom points to it the customer will notice a different looking flange finned cast iron housing. Inside are two 12 in. diam circular aluminum discs instead of the usual brake shoes. When applied these annular discs each having six segments of lining cyclewelded to the aluminum, push out against both the inner and outer housing.

Such design overcomes the two major problems of wheel brake design, Chrysler engineers claim. One important advantage of the new brake is the elimination of fade, which is a decrease in coefficient of friction of the brake lining due to an increase in tem-

perature. The other disadvantage overcome is loss of reserve, which is the greater pedal travel required to obtain braking effect when the drum expands away from the lining due to an increase in temperature. Fade is practically eliminated because of the greater lining area and the improved cooling characteristics of the disc design. Braking reserve is greater because the critical distortion of the brake housing is across its width parallel to its axis rather than along its diameter. Expansion of the brake housing away from the lining in the new brake is negligible because the distance across the housing is only about one fourth of the diametral distance.

Brake Is Self Energizing

Self-energization of the new brake is obtained by utilizing the friction forces which tend to rotate the pressure plates in the direction of housing rotation. When contact is established between the two pressure plate linings and the brake housing the rotating motion of the housing tends to drag the pressure plates around with it.

During forward motion of the car the inner plate is held rigid and

only the outer plate is free to rotate a slight amount. Therefore, when the brakes are applied the resulting additional forward movement of the outer plate with respect to the inner plate forces the steel balls higher on their ramps to provide greater contact pressure between linings and the housing. Thus, some of the energy due to the forward motion of the car is used to increase the braking effect. In reverse the outer pressure plate becomes a fixed plate on the rear wheels and self-energization is provided by the movement of the inner plate when it contacts the housing.

Auto Accessory Business Gaged by Public Acceptance

In 1948 the whole replacement parts segment of the auto industry did a \$2.6 billion business. Today it is estimated that 1949 auto replacement parts business will total about \$2 billion. In 1941 the replacement parts sales amounted to \$800 million. Although no breakdowns are available a large chunk of this business in each of the years was accounted for by sales of accessories.

In the last 3 years the accessory market has been too tainted to serve as a guide as to what the buying public wanted. However, the present market conditions have returned this segment of auto industry to normal and the accessories are again becoming the front line sounding board in gaging public acceptance as to what should or should not be considered standard automobile equipment.

The definition of accessories changes constantly. What was an extra or an accessory a few years ago is now standard equipment in many cases. State laws in the past have demanded that certain items which started as accessories or extras be used on all cars licensed in that particular state. Safety glass, which was first sold as an extra, is the best example. Today directional signals are fast becoming so popular that they too soon may become standard equipment.



ETCHING: Ford Motor Co. engineers have a new way to study metallic structures. The new method is called cathodic vacuum etching. The metal is placed in a partial vacuum containing argon gas. A charge of 12,000 volts of electricity is applied. This creates argon ions which bombard the metal's surface, knocking off minute particles and bringing out the true structure of the metal with improved detail and clarity.

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UNITED STATES STEEL

WEST COAST PROGRESS REPORT



Pacific Northwest expects to need from 1 to 1½ million tons of industrial carbon by 1960, without coal and oil resource.

Digest of Far West Industrial Activity



by

J. P. Reinhardt

Portland, Ore. — Sizeable current and probably multiplied future requirements for industrial carbon in the coal- and petroleum-sparse Pacific Northwest are summarized in an authoritative survey-report by Ivan Bloch, consultant, to the Pacific Northwest Field Committee, U. S. Dept. of the Interior, just issued. This present and potential market, with its attendant problems and limitation, is one to raise eyebrows and cause further searching and scratching study.

Electroprocess industries, particularly aluminum, are expanding rapidly in this area and require large quantities of carbon as a raw material, entering into chemical and metallurgical processes and for the manufacture of electrodes. Current Pacific Northwest consumption of coke and coke breeze for industrial purposes is found to be somewhere between 100,000 and 150,000 tons per year. In addition there is current consumption of petroleum coke for aluminum reduction of about 160,000 tons per year and an additional 40,000 tons of both hard and soft coal-tar pitch.

Mr. Bloch has carefully analyzed and estimated the Pacific Northwest production and power requirement for electro-chemical

industries in the area as of 1960, with various adjustments for technological change and trend, and comes up with the following carbon requirements as of that date:

Petroleum coke	647,000-886,000 tons per year
Coke and coke breeze	273,000-548,000 tons per year
Soft coal pitch	188,000-273,000 tons per year
Hard coal pitch	33,000 tons per year
Charcoal	18,000- 54,000 tons per year

Estimates Serve as Goals

These estimates are admitted as goals, to make certain that limitations in supplies of carbon do not become a restrictive factor on Pacific Northwest industrial expansion. Moreover they could be subject to shift based on any

changes in practice, in relative price or in availability, particularly if charcoal or acceptable grades of coal chars could be produced, or even "super cokes" from specially prepared coal.

It is assumed that if electrodes were manufactured in the Pacific Northwest one-third of the installation might be of the Soderberg self-baking type and further that electrodes will consist of a mixture of 85 pct calcined petroleum coke and 15 pct pitch binder. Whether carbon is required as a reducing agent or for electrode manufacture, in the Pacific Northwest it must be in a form which provides high fixed carbon, low ash and low volatile content. Furthermore the ash must be within generally low tolerances for phosphorus and sulphur, and frequently low in silica and alumina. Its physical characteristics may be of a porous, brittle and hard material as calcined petroleum coke or in the form of soft coal or tar pitch. It may have low resistivity in electrical characteristics and it must also have a low reactivity index if used for electrodes. Generally it need not have high physical strength.

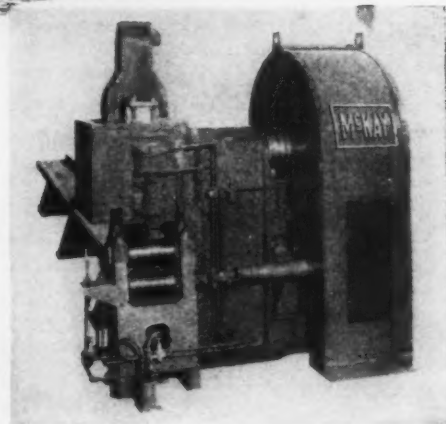
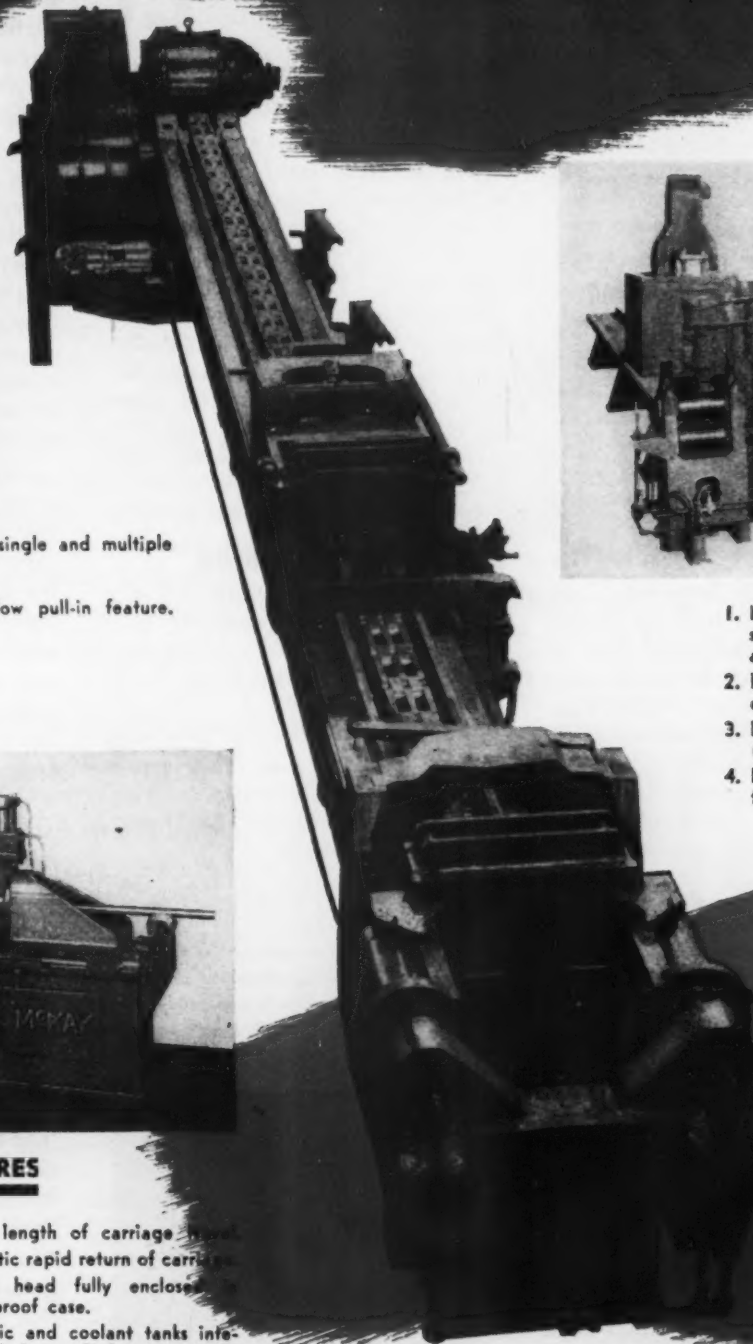
Not Enough Coke Material

Aside from its relatively high price, calcined petroleum coke seems to possess the most desirable all-around characteristics and is the exclusive carbonaceous body material currently utilized by the aluminum industry for electrodes. Aluminum reduction requires by far the most restrictive specifications for its carbon, with at least 98 pct fixed carbon content, less than 0.5 pct moisture, volatiles and ash, and electrical resistivity of 0.003 ohms per cu in.

Of the 100,000 tons of coke and

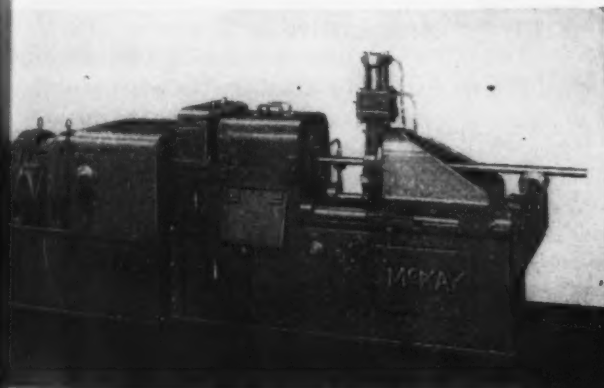
McKAY

BAR DRAWING EQUIPMENT



- 1. Hydraulic push pointers are optional.
- 2. Automatic wedge type grip-buggy for single and multiple draw with quick change feature.
- 3. Hydraulic or pneumatic throw-off arm.
- 4. Hi-speed automatic grip-return with slow pull-in feature.
- 5. Steel construction throughout.
- 6. Constant or variable speed drive.
- 7. Built for single or multiple draw.

- 1. McKay open throat bar shear features the air operated pinch rolls (optional).
- 2. Hold-down gag for square cutting.
- 3. Dumping type gauge table (optional).
- 4. Heavy mill type construction throughout.



IMPORTANT FEATURES

- 1. Tip control of tool speeds (minimum to maximum).
- 2. Automatic rapid return of carriage.
- 3. Variation of feed control.
- 4. Cutting head fully enclosed in splash proof case.
- 5. Pre-set length of carriage.
- 6. Automatic rapid return of carriage.
- 7. Hydraulically operated grips.
- 8. Hydraulic and coolant tanks integral with base. Sight gages indicate fluid level.

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF TUBE AND BAR DRAWBENCHES AND BAR SHEARS

YOUNGSTOWN, OHIO

coke breeze shipped into the Pacific Northwest for industrial purposes in 1947 almost all came from Utah, Colorado and British Columbia. A war-born coke plant at Tacoma with rated capacity at 75,000 tons per year has never been successfully operated and has been offered for sale without bidder by the War Assets Administration. Petroleum coke has been available as a by-product of petroleum refining, principally from southern California with some from Wyoming and Texas.

Pollution Board Wants Action

Los Angeles—With the smaller gray iron foundries still debating their fate (THE IRON AGE, Aug. 18, 1949, p. 50), the sharpened fangs of the Air Pollution Control Board struck at Bethlehem Pacific Steel Co. as it asked for 17½ months to install antismog equipment valued at \$400,000 on its three openhearth furnaces. Although the board took no immediate action, it indicated that it will insist on quicker installation.

Bethlehem-Pacific pointed out, as have the gray iron foundrymen, that nowhere else in the nation are the laws so stringent and new equipment must be developed to meet requirements. The \$400,000

equipment will include electric precipitators to trap precipitate matter in waste gases from the furnaces. It will take nearly 6 months for design and placing contract, then 12 months for delivery and installation.

Awarded Cracking Unit Contract

Salt Lake City—Contract for a multi-million dollar catalytic cracking unit has been awarded to the Bechtel Corp. of San Francisco by the Salt Lake Refining Co., subsidiary of Standard Oil of California. The new unit, a Houdrifiow Process cracker will be part of a \$10 million expansion of facilities of the Salt Lake Refinery to process crude oil from Rangely, Colo. The new unit will be started and completed next year.

Adds Hot Dip Galvanizing

Seattle — Large scale hot dip galvanizing of cans, pails, buckets and household wares is being carried out by Northwest Metal Products Co. at Kent, Wash. Items are manufactured of black iron and dipped in molten zinc. This is said to be the first application of this process in the Pacific Northwest to household wares.

Skilled Labor Surpluses May Result from Navy Cutbacks

Los Angeles — Labor surpluses in such skilled fields as boiler-making, welding, riveting, metal-working and similar fields appears certain in the Los Angeles area during the next year as a result of drastic Navy cutbacks among civilian workers.

Striking harder in this area than anywhere in the country, the Navy announced last week that it will close the big war built Navy shipyard on Terminal Island releasing 5400 of its 5800 employees. Other resulting cutbacks will increase the total slashed from government payrolls to 6000 and will knock off about \$2 million from the monthly income of the area.

In addition to creating a new surplus among workers in heavy industry, the closing of the shipyard emphasized again a problem for all facilities on Terminal Island—the gradual sinking of the island, now at a rate of 10 to 15 in a year. The cost of protective bulkheads would be \$4,500,000 or more. Money toward this has been appropriated by Congress. Ford, which has its southern California assembly plant on the edge of the island, already has spent considerable on diking up the area.

The shipyard layoffs are to be spread over a period of a year. About 1500 men previously had been cut from the payroll during the last 6 months.

If the cutback had to come in southern California, it probably was better in the Los Angeles area than in San Diego, the other possibility, where the Navy is the "number one" industry. Many of the ships now based at Los Angeles probably will operate from San Diego and San Francisco.

Steelworkers Return to Work

Seattle—Upon receiving a 12¢ an hr wage increase retroactive from July 16, 1948, 200 CIO steelworkers returned to the Northwest Steel Rolling Mills after an 81-day strike.

WESTERN STEEL: Under-driven, detached-type vertical edger installed on the entry side of the four-high reversing mill that serves as a rougher in the converted plate mill of Geneva Steel Co., U. S. Steel subsidiary. The edger assists in maintaining width uniformity and conditions slab edges in the production of both plates and hot-rolled breakdowns for coils.



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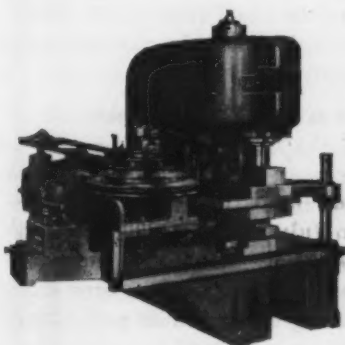
Multipress is available in a complete range of frame sizes, in capacities from 1 to 35 tons. A choice of widely interchangeable controls, operating features, accessories and attachments makes it easy to tailor these standard units to your exact needs—at low cost. Let us send you further details. *Write today.*

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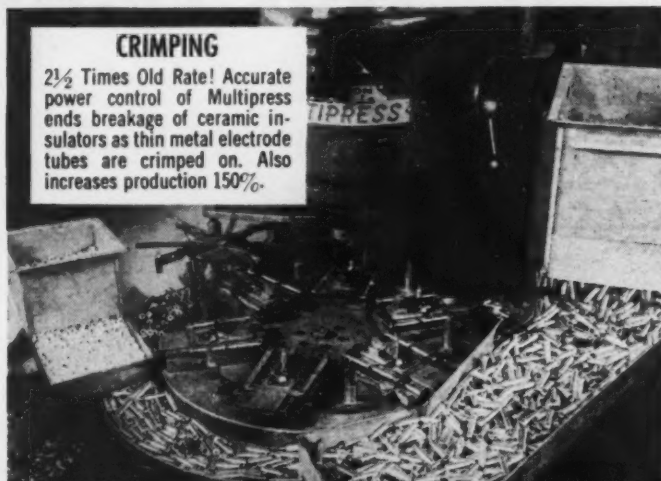
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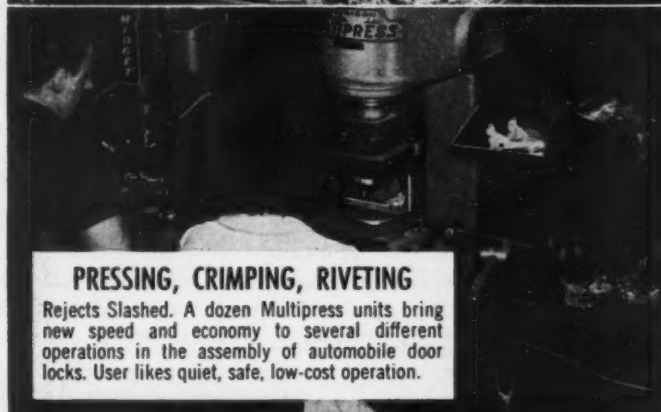
CRIMPING

2½ Times Old Rate! Accurate power control of Multipress ends breakage of ceramic insulators as thin metal electrode tubes are crimped on. Also increases production 150%.



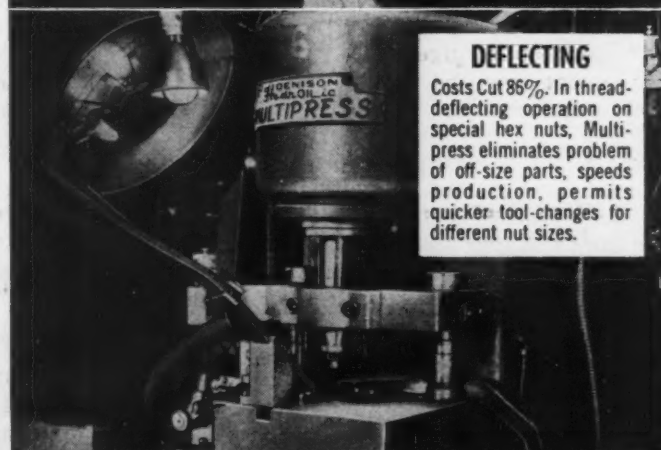
PRESSING, CRIMPING, RIVETING

Rejects Slashed. A dozen Multipress units bring new speed and economy to several different operations in the assembly of automobile door locks. User likes quiet, safe, low-cost operation.



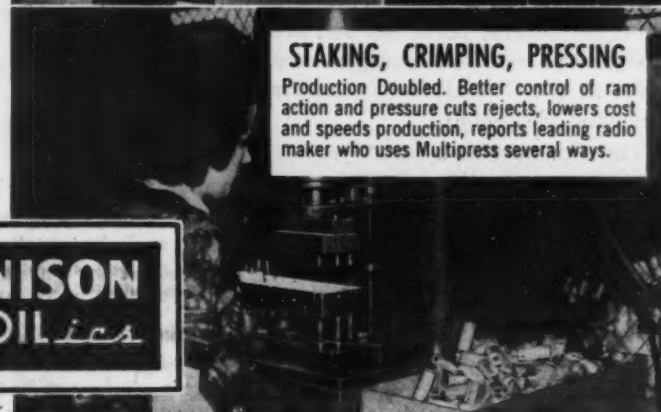
DEFLECTING

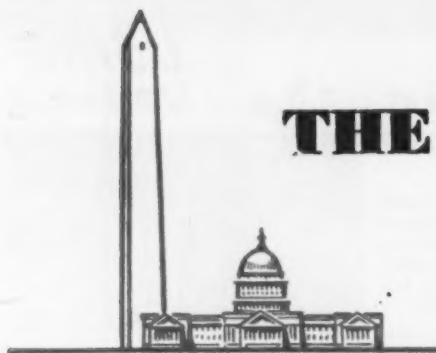
Costs Cut 86%. In thread-deflecting operation on special hex nuts, Multipress eliminates problem of off-size parts, speeds production, permits quicker tool-changes for different nut sizes.



STAKING, CRIMPING, PRESSING

Production Doubled. Better control of ram action and pressure cuts rejects, lowers cost and speeds production, reports leading radio maker who uses Multipress several ways.





THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

Federal Trade Commission's plea for additional funds for new investigations not allowed . . . Basing point legislation shows no signs of making any headway.



by

Eugene J. Hardy

Washington—The Federal Trade Commission's hopes for additional funds with which to pry further into business practices have been dashed on the rocks. Originally, FTC had asked for almost \$800,000 in new funds to investigate alleged restriction of production, collusive geographic pricing formulas and other business practices which FTC feels restrict competition. The Bureau of the Budget cut out this amount and Congress, in approving an appropriation of \$3.65 million for the fiscal year 1950, upheld the Bureau.

Based on past experience, no great loss will be entailed by this slight clipping of the Commission's wings. Practically all of the FTC reports on business practices are based on published material, are generally several years old, and are designed to beat the drum for some point in the Commission's peculiar economic philosophy.

The Commission's recent report on the concentration of productive facilities, covering the year 1947, is an excellent example. The principal conclusion that can be drawn from this report is that there are a number of very large industries and firms, a still larger number of moderate-sized industries and firms,

and a big batch of smaller ones.

From the standpoint of timing, however, FTC did quite well with this latest effort which contains little that is new. FTC hopes that this report will help to prod the Senate into acting on the House-approved bill which gives FTC the power to block the purchase by corporations of the physical assets of competitors if such purchase would substantially lessen competition. This amendment to the Clayton Act has been a prime FTC objective for several decades. The law now bars acquisition of stock only.

Admits Possibility for Errors

The report uses net capital assets as the measure of concentration. The entire document is carefully hedged so as to indicate that FTC does not claim it is an absolute measure. Stating that "the figures are no more than estimates," FTC admits the possibility of errors from such things as inclusion in one industry of assets engaged in another. It is pointed out, however, that such errors "probably do not exceed a few percentage points on either side of the figures given."

Based in large part on published financial data, the report states that 46 pct of the total net capital assets

of all manufacturing corporations in 1947 was concentrated in the 113 largest manufacturers. These firms, each with assets in excess of \$100,000,000, owned \$16,093,000,000 of net capital assets.

Included in the extreme concentration group in which 60 pct control is reached by three or fewer companies are the following industries, (with pct of control): Aluminum, 100; tin cans and other tinware, 95.3; copper smelting and refining, 88.5; plumbing equipment and supplies, 71.3; office machinery, 69.5; motor vehicles, 68.7; and farm machinery, 66.6. In the high concentration group (those in which 60 pct control is attained by five or six companies) the following industries are included: Primary steel, 63.4; industrial chemicals, 62.7; and aircraft and parts, 60.4. Electrical machinery with 60.1 pct control in the hands of 14 companies is included in the moderate concentration group.

Steel Ranked Thirteenth

Of the 26 industries covered in the report, steel ranked thirteenth in the tabulation showing the degree of control attained by the largest corporation in the industry. The report lists the following steel firms as having the indicated percentages



BEARING FAILURES DOWN...STEEL PRODUCTION UP

Sun Grease Increases Production by Cutting Bearing Failures 92%

Burned-out table roll bearings were causing loss of valuable production-time in a steel mill. The failures—as many as five a week—were due to the grease melting and running out as a result of heat reflected from the steel plates. Each bearing-replacement cost \$80, not counting labor cost.

A Sun Engineer who was called in recommended a high-melting-point grease that had proved its ability under similar conditions.

With this Sun lubricant on the job, 92 percent of the bearing failures have been eliminated. A cash saving of about \$18,000 a year has resulted, and additional

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of the industry's total net capital assets: U. S. Steel, 28.6; Bethlehem, 13.4; Republic, 7.2; Jones & Laughlin, 5.3; National, 5.3; Armco, 3.6; Inland, 3; and Youngstown Sheet & Tube, 2.9.

Basing Point Legislation Remains Firmly Deadlocked

Basing point legislation remains firmly deadlocked. Members of a Senate-House conference appointed to iron out differences between the two bills already passed are continuing their meetings, but with nothing to show for their talks.

The differences of opinion are over the Kefauver amendment to the Senate bill, and the Carroll amendment to the House legislation. There is some talk of compromising on the Senate version of the bill, despite comment from industry that no bill at all would be preferable to either the Senate or House bills in their present form.

Meanwhile, the House continues its recess until Sept. 21. Even if the conferees should come to agree-

ment soon, no formal action can be taken on the two bills until that date, for Speaker of the House Rayburn has ruled that no business will be transacted during the vacation interval.

The Federal Trade Commission, with its long record of opposition to any legislation on the subject, is privately pleased at the failure of conferees to reach agreement thus far. One FTC official ventured the off-the-record opinion recently that the commission is now "pretty confident" that there won't be any legislation on the subject this year.

But pressures for clarifying legislation, far from abating, continue to mount. Although it is an open question of whether or not agreement will be reached during the present session of Congress, there is stronger pressure each week from many types of business for clear-cut settlement of this important issue.

Broadens Services' Authority

The military services authority to renegotiate contracts will be

broadened considerably under the provisions of the pending \$15 billion military appropriations bill. The new amendments provide that negotiated contracts and subcontracts in excess of \$1000 are made subject to renegotiation. However, as is the case under existing law, the aggregate amount of contracts held would have to exceed \$100,000 before any renegotiation could take place.

Another provision of the bill of interest to industry would ban time studies in government industrial plants. This would be achieved by prohibiting the expenditure of funds for contracts for studies with stop-watches or other time-measuring devices or for salaries of government employees who might undertake such studies.

Legislation Not Likely On State Industrial Programs

Despite approval by the Senate Labor Committee of legislation to provide federal funds to the states for cooperative programs designed to reduce industrial accidents, there is little chance for final Congressional approval at the current session.

The measure now before the Senate (S 1439) would provide for grants not to exceed $\frac{3}{4}$ of the state expenditures, but not less than \$15,000 annually. The law would be administered by the Secretary of Labor who would approve the state plans.

Similar legislation (HR 3283) has been introduced in the House, but has not yet been acted upon by the House Labor Committee.

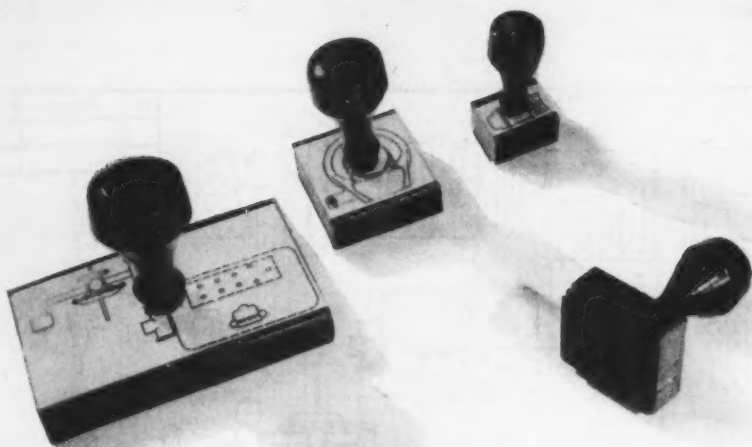
This legislation came about as a result of the President's Industrial Safety Conference, held last spring, at which time Mr. Truman set a goal of a 50 pct reduction in industrial accidents within 3 years from the present 2,000,000 annual rate.

There is considerable Congressional interest in the subject, however, and only the jam into which Congress has gotten itself prevents favorable action on legislation setting up a federal-state program.

THE BULL OF THE WOODS

By J. R. Williams





Reducing Engineering Costs With

RUBBER STAMPS

By L. H. REMIKER

Chief Engineer,
Lindberg Engineering Co.,
Chicago



SUMMARY: Greater accuracy and uniformity, plus substantial cost savings can be achieved by the use of rubber stamps for reproducing circuits, titles, components, etc., on engineering drawings. Economies are reported in the range of 50 per cent under the cost of hand drafted drawings. How the stamps are used, cost of stamps and results of 8 years' experience are described.

SINCE their adoption, some 8 years ago, rubber stamps have proved so successful in reducing engineering costs that about 300 such stamps are currently in use at the author's plant. Although the experiences related in this article are associated with the manufacture of furnace equipment, the technique is equally applicable to other assemblies. Greatest use has been in the electrical field, primarily on schematic wiring diagrams which are sent to customers, electrical contractors or field service engineers, but rubber stamps have also found importance in schematic piping diagrams and small detail work of a repetitive nature.

Schematic wiring drawings cannot be made to scale due to the prohibitive cost. Consequently the draftsman or engineer must make a pictorial display of the pieces of equipment such as motor starters, control apparatus, circuit breakers, pyrometers, gas control equipment, etc., and, as a result of the human element, these drawings are not uniform, either in size or detail. In other words, according to the pressure of work, a drawing may one day contain great detail and painstaking care in construction, and on another day may be rather sketchy in showing various pieces of equipment. If such variations are obtained from the efforts of one individual, consider the

Reducing Engineering Costs

Continued

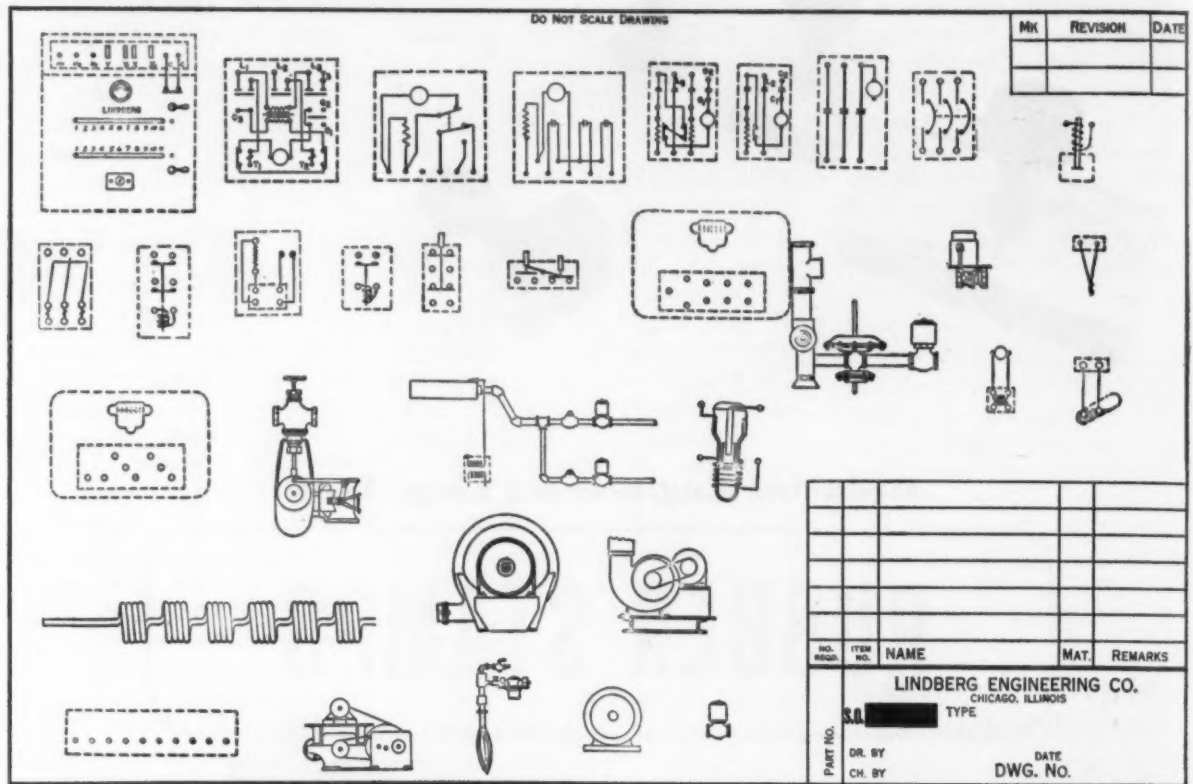


FIG. 1—Typical examples of components reproduced by rubber stamps currently in use at Lindberg Engineering Co. Ink used with these stamps should have opacity.

FIG. 2—Examples of rubber stamps containing titles and descriptions. It is recommended that titles and description stamps, such as these, not be included on the stamps with drawings to give greater flexibility in drawing in the wires and in placing the titles.

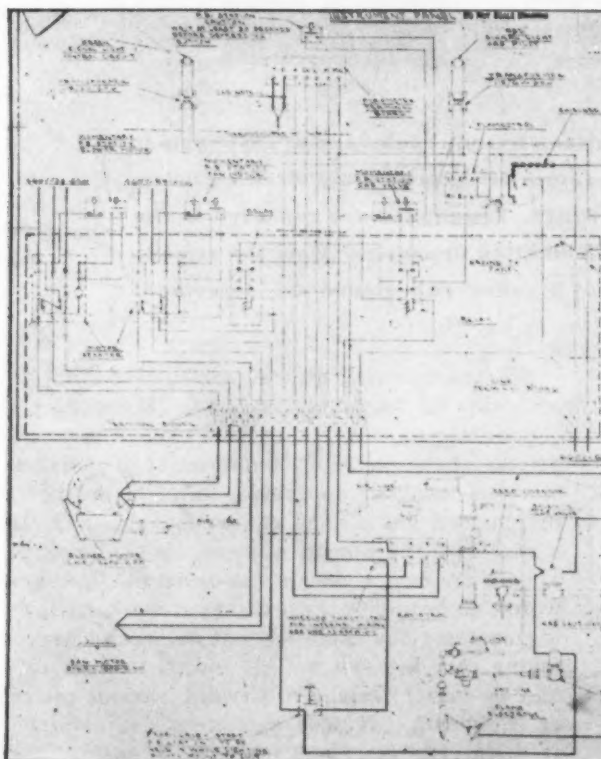
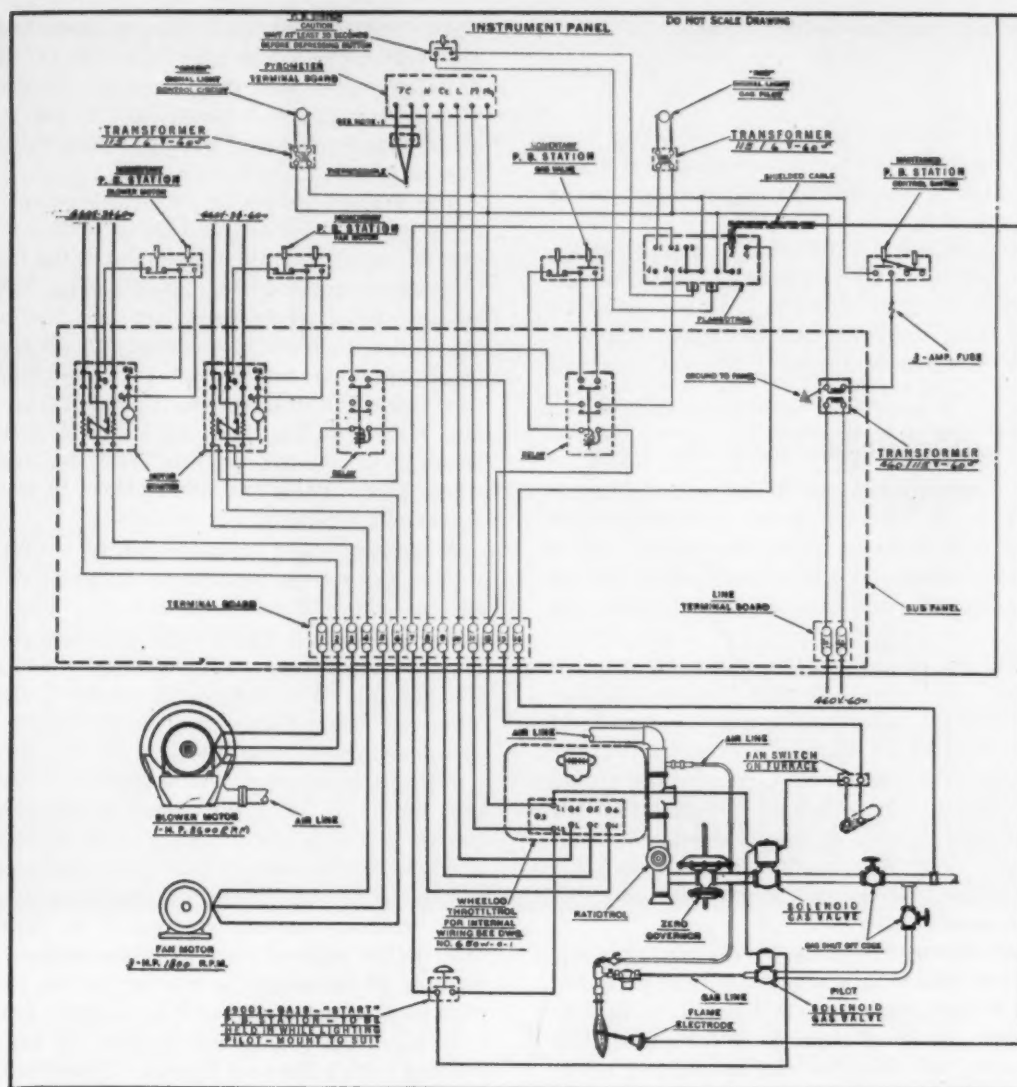
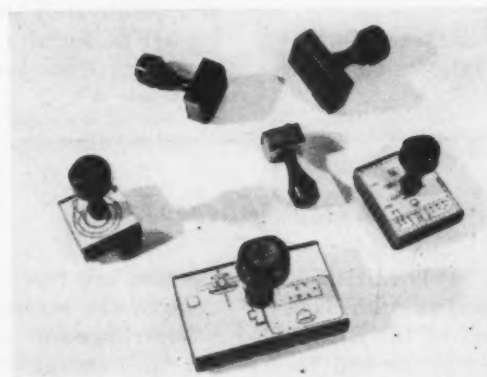


FIG. 3—Wiring diagram of a gas fired pit Cyclone furnace made by conventional drafting techniques, without the use of rubber stamps.



ABOVE
FIG. 4—This wiring diagram is a duplicate of fig. 3, except that rubber stamps have been used in its preparation.



LEFT
FIG. 5—Examples of stamps currently in use at Lindberg Engineering Co. for reproducing components of drawings as well as titles.

increased variation from several draftsmen.

These problems have been completely overcome with the use of rubber stamps, which not only give a high degree of standardization but produce a neatness that is difficult to surpass. Clear, legible drawings instill in the recipient a feeling of confidence in both the drawings and in the organization responsible for the drawings. Another advantage lies in the ability to discuss such

drawings over the phone more intelligently, with consequent elimination in tension and nervousness, and, in the case of long distance calls, a substantial reduction in cost.

Rubber stamps reduce the possibilities of drawing errors and time required for checking drawings, because it is impossible for the draftsman to omit detail on a component part. He is sure to have every terminal on an electrical com-

Reducing Engineering Costs

Continued

ponent, for example, because if one is not connected it quickly calls to his attention that a line may have been omitted, and he naturally checks to be sure.

Concerning the life of rubber stamps, suffice to state that some stamps have been in constant use at Lindberg Engineering for 8 years, and judging from their present condition will give many more years of service. Normal care will

This article is based on a paper delivered at the recent annual meeting of the Industrial Furnace Manufacturers Assn., held in Virginia Beach.—Ed.

give good life. When not in use, stamps should be hung in an inverted position—holders with spring clips are excellent for this purpose—so as not to collect dust and dirt. Dirty stamps should be cleaned with a brush, soap and water, or alcohol.

Another important factor for quality work is the type of ink employed. Ink used should possess considerable opacity, so as not to permit light to pass through. Of more importance is that the ink be of a quick-drying type, i.e., the ink should dry in about 3 to 5 sec to such a degree that the hand can be rubbed over the impression without smudging. For the work described in this article, Markrite 101 general purpose black ink has been successfully used.

Rubber stamps are made by the photographic etching process, with a zinc plate first produced and the rubber stamp made from it. There is a minimum charge of about \$5.00 for a zinc plate 2 in. square, but this cost can be reduced somewhat by grouping small drawings so that several of them can be contained within one 2-in. square zinc plate.

In fig. 1 are shown some typical stamps in current use. The rubber stamps vary in cost from

\$1.00 for the very small ones to about \$6.50 for the largest one. The zinc form for the largest drawing would also cost about \$6.50, giving a total cost of \$13.00. Stamp cost is independent of the amount of detail that goes into the stamp; cost is based solely upon size.

The stamps shown in fig. 2 are composed of titles and descriptions and these could be incorporated into the main stamps illustrated in fig. 1. It is not suggested that this be done, however, because the latter drawings are well filled within the border lines and it would be difficult to insert the identifying comments. It is recommended that titles and descriptions be handled as separate stamps so that one can stamp in the main pieces of equipment, draw in the wires and then stamp in the titles and descriptions in the most convenient locations.

A comparison of results obtained with rubber stamps and conventional drawing practice is indicated in figs. 3 and 4, respectively. Fig. 3 was made by a usually rapid draftsman and the time required to draw it, without using stamps, was 5¼ hr. Fig. 4 is a duplicate of fig. 3, the only difference being that rubber stamps were used; this drawing was completed in 2½ hr. In addition to the substantial saving in time of preparation, note also the improvement in neatness and clarity in the latter drawing. Fig. 5 suggests how the stamps are arranged in actual practice.

As to savings in time of preparation of drawings, utilizing rubber stamps, it is estimated that, on the basis of some 2700 drawings, a minimum of 50 pct would be representative. Hence, with an average saving of 3 to 4 hr per drawing, a total saving of about 10,000 hr has been realized within the past 8 years. Therefore, with an \$800 to \$1000 investment in rubber stamps there has been achieved not only a saving in time of approximately 10,000 hr, but greater accuracy, greater uniformity and a neater, more pleasing appearance have been obtained.

New Books

"*British Empire Trades Index*," 1949 edition, is of special interest to those dealing with business firms located in any part of the British Commonwealth. This completely revised index contains full particulars of over 65,000 firms, classified under some 3000 separate trades, and is useful for buying, locating addresses, and locations of new sources of supply. Business Dictionaries, Ltd., 133-137 Fetter Lane, London, EC.4, England. \$6.50.

* * *

"*Unified Screw Thread Standards*," Circular 479, contains detailed illustrations, tables and numerical data setting forth the new standards of thread form recently agreed upon by American, British and Canadian authorities. In-

cluded are the proceedings of the meeting at which the accord for unification was signed. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 30¢. 27 p.

* * *

"*Dynamic Equipment Policy*" by George Terbough. The author's purpose is to provide a source of references and education in re-equipment policy for industrial management. Presented is a formula to avoid a decline in living standards and unnecessary unemployment, in addition to a discussion of errors of rule-of-thumb replacement policies. McGraw-Hill Book Co., Inc., 330 W. 42 St., New York. \$3.75. 285 p.



FIG. 1—Part of an installation of induction heaters for softening selected areas of sheet steel for subsequent forming operations.

INDUCTION ANNEALING

Simplifies Metal Forming

By L. R. MUELLER

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THE physical properties of the sheet steel used in making metal parts become increasingly important as the complexity of the piece increases. Consequently, a large part of the problems involved in metal forming is concerned with the physical properties of the metal itself.

Sheet steel with the required physical qualities is not always on hand in quantities adequate to meet changing production requirements.

Manufacturers, in order to keep production at a satisfactory level, frequently use steel not originally intended for forming. The inevitable consequences are a rapid increase in the amount of scrap, shortened die life, and other complications in the production process.

Most of the trouble is due to the steel stock having excessive hardness. This condition frequently leads to the actual tearing of the metal

Summary: Use of induction heating to selectively soften sheet metal for forming operations permits the use of hard sheets where proper tempers for forming are not available from stock. The author cites case histories where high breakage rates and expensive salvage work have been overcome by use of this technique.

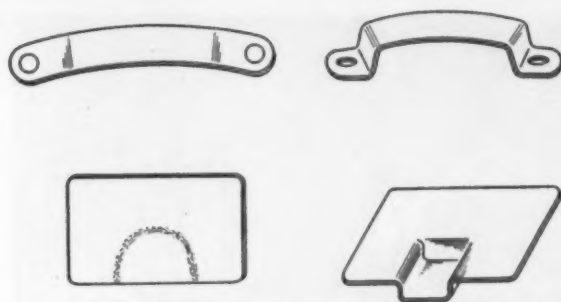


FIG. 2—Examples of sheet steel parts which lend themselves to selective annealing prior to forming.

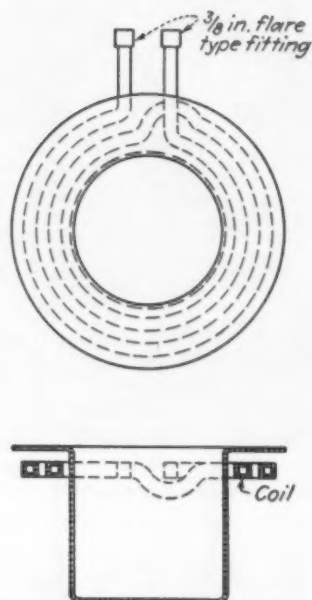


FIG. 3—Method of applying heat to a deep drawn kettle to eliminate stresses and work hardening at the lip.

during the forming process, resulting in a scrap piece. Aside from the actual tearing of the metal, there are other disadvantages: (1) Extreme brittleness accompanied by decreased strength of the final part; (2) reduced die life; (3) lack of uniformity in the final product, and (4) increased inspection and production quality control cost.

In many cases where the parts are large and expensive, or where the rejection rate is very high, it has been necessary to repair the damaged pieces in order to keep production at some tolerable figure.

For example, one large Milwaukee manufacturer of automobile and truck frames found rejections running as high as 45 pct because of the tearing of one type of metal stamping. In order to meet the schedules of the automotive manufacturers, it became necessary to repair as many of the units as possible, since sheet steel was not available in sufficient quantities to permit the scrapping of every damaged piece. This repair work had to be done by skilled welders and grinders. The damaged parts were

diverted from the main production line and were repaired individually after the welder had determined the best method to correct the defect. The cost of repairs was high.

Final inspection was considerably more complicated, for not only did the piece itself have to be inspected but the repairs had to be carefully checked to insure that the final assembly met the specifications. Since an automotive frame is subjected to very high stresses during use, it was imperative that close control be exercised over the quality of the final product. Although production requirements were met by repairing defective stampings, it was found that the addition of the highly skilled manual labor necessary to meet this production figure resulted in manufacture at a loss.

Scrap Eliminated

Annealing of the piece before forming would have provided the right physical characteristics, virtually eliminating the production of scrap. Since annealing furnaces are not ordinarily a part of a sheet metal forming department, it meant that additional equipment would have to be installed to do the job. Floor space was not available for the installation of the required furnaces and neither was space available for the necessary stockpiling of pieces awaiting their turn in the furnaces. In addition, heating of only those areas of the stampings which were going to be highly stressed in forming was not possible, and an unnecessary expenditure of both time and money would have been required in heating up areas of the piece which were not critical.

The answer was found in the selective softening of the critical areas where forming was to be done by means of high frequency induction heaters. The modern induction heater is basically a device which is capable of delivering a large amount of energy to a selected area. It is possible to transfer as much as 250 Btu per sq in. per min to the part with an induction heater.

This extremely high rate of energy transfer to the piece with high frequency induction heat makes the softening problem a matter of seconds. Typical softening times run from 7 sec for $\frac{1}{8}$ in. stock to 18 sec for $\frac{1}{4}$ in. stock. Since a portion of the piece can be softened in a few seconds, it is not necessary to stockpile a large amount of material to permit the annealing in large batches, as would be necessary with a furnace. Consequently, the introduction of high frequency annealing did not in any way complicate the flow of material from the raw sheet to the final piece, since it did not introduce a batch type process into what is essentially a continuous flow process.

The heating can be confined only to the area requiring annealing by designing the work coil or applicator coil so that it covers only the area to be treated. Power requirements are

determined only by the critical areas in the piece and not by the entire mass. The selectivity of induction heating coupled with the small floor area required for a given amount of power made it possible to install induction heating in the existing floor space of the frame plant without special provisions. Since heat is developed in the work only, it was unnecessary to take special precautions to protect personnel, buildings and equipment from the effects of the heating process. Hence, integration of an induction heater into the production line was a simple job.

A standard 20 kw high frequency induction heater requiring approximately 9 sq ft of floor space was installed and there was no problem or delay in getting it on the line.

The manufacturer found that scrap due to undesirable high hardness of the sheet steel was reduced to zero, and the total scrap from all causes was reduced to near zero. In addition, it was found that a superior product could be produced and none of the parts were unduly work hardened with a consequent loss or deterioration of toughness. No special facilities were required for the installation of the heaters and no changes in the production process were required. Sixty kw of installed capacity was found to be adequate to handle the entire production, which meant a use of approximately 27 sq ft of floor space for the induction heaters proper, and approximately the same amount of floor area for fixtures and working space for the operators. Fig. 1 shows a portion of the installation. Some of the typical sheet steel shapes which can be effectively annealed are shown in fig. 2, while table I gives four typical case histories in which induction annealing helped solve the problem.

Forming Lips and Beads

The problems of forming steel are not necessarily confined to automobile frames. For example, the production of pots, pans, and kettles frequently requires the forming of a lip or bead around the edge of the pot which means very sharp bending and stressing of the metal with consequent tearing. A number of manufacturers of pots and pans have found that scrap could be sharply reduced by annealing the lip prior to forming the bead. In a typical case, the bead is annealed by placing the pot in a simple two-turn coil and annealing only the area which had been stressed.

Since the work hardening which had been developed in the initial steps was effectively removed, the manufacturing process could be completed without making the product so brittle that completely satisfactory results were impossible. Fig. 3 shows a method of applying induction heat to a deep drawn kettle to eliminate stresses and work hardening at the lip.

TABLE I

Some Case Histories of the Use of Induction Annealing by an Automobile Frame Manufacturer. Steel analysis—0.08 to 0.15 C, 0.30 to 0.60 Mn. Heating temperature approximately 1600°F.

CASE NO. 1

PART: Kickup reinforcement 3/32 in. thick.

SIZE OF RUN: 6300 pieces.

PROBLEM: 17 pct breakage and 2 pct scrap in draw operation. Three men required to grind and ream cupped hole. No annealing facilities available.

SOLUTION: Install 20 kw induction heater using copper tubing coil.

COST ANALYSIS*

	Previous Method	Present Method
	Pieces Cost	Pieces Cost
Anneal		6300 \$45.36
Grind and ream ..	6300 \$64.53	
Gas weld after breakage	1083 60.64	
Grind after gas weld	800 16.00	
Scrap after draw	141 25.76	
	\$166.93	\$45.36

SAVING: \$121.57 per run or cost reduction of 73 pct.

CASE NO. 2

PART: Forged lever.

SIZE OF RUN: 9058.

PROBLEM: Steel required normalizing after bending operation. Normalizing of entire piece expensive.

SOLUTION: Induction heat levers to normalizing temperature with automatic timing.

COST ANALYSIS (per 100 pcs.)*

	Previous	Induction Normalize
Normalize	\$0.80	\$0.39
Pickle	0.61	
	\$1.41	\$0.39

Saving per 100 pcs: \$1.02. Saving per run: \$92.39.

CASE NO. 3

PART: Front cross-bar (1/8 in. stock)

SIZE OF RUN: 7000 pcs.

PROBLEM: Excessive cost and delay in normalizing in gas fired furnaces with subsequent pickling operation.

SOLUTION: Induction heat cross-bars to normalizing temperatures with automatic timing.

COST ANALYSIS (Cost per 100 pcs.)*

	Previous	Induction Normalize
Normalize	\$0.80	\$1.17
Pickle and roll	0.988	
	\$1.788	\$1.17

Savings per 100 pcs: \$0.614. Savings per run: \$43.26.

CASE NO. 4

PART: Front cross-bar 7/64 in. thick.

SIZE OF RUN: Approximately 25,000 pieces per month.

PROBLEM: Excessive cost and delay in gas-fired annealing process. Entire piece did not need annealing.

SOLUTION: Install separate induction heater devoted entirely to this job right in punching department eliminating trucking costs within plant.

COST ANALYSIS (Cost per piece)

	Previous	Induction Anneal
Rate x man hours	\$4.046	\$1.396
Power or fuel	5.022 (bu-tane)	.644 (power and tube depreciation)
Trucking .....	.804	
Total	\$9.872	\$2.040

Savings per month: \$2,126.25 (27,270 pcs.)

* Does not include cost of gas, power or equipment used in either method.

Heat Treatment of Tool Steels

by MARTEMPERING



By RICHARD PAUL SEELIG

SUMMARY: A practical heat treater considers the application of martempering to heat treating tool and die steels in comparison with other heat treatment procedures. Outlining practical experiments conducted with various steels, the author evaluates the influence of heat treatment variables on hardness and distortion and dimensional stability.

WHILE many progressive heat treaters have been able to utilize in their work a substantial portion of the wealth of data published on isothermal transformation and related phenomena, much pioneering is needed to bring this scientific know-how into play and combine it with heat treat practice, especially on small scale operations. One of the obstacles to the general acceptance of treatments more complicated than plain heating, quenching and tempering, is increased cost. In order to achieve the utmost benefit from such treatments as martempering, for example, better control, more time and different equipment is needed.

Those who have had an opportunity to observe the relative performance of tools treated to various standards will agree that the additional time and cost of special modern treatments are often justified.

To illustrate this point, consider an intricate punch that has to have a liberal grinding allowance because of anticipated distortion in hardening. As a result, the grinding time is about 18 hr. By martempering the same punch, its size change and distortion are so small that only a light grinding cut, amounting to a cleaning-up, and

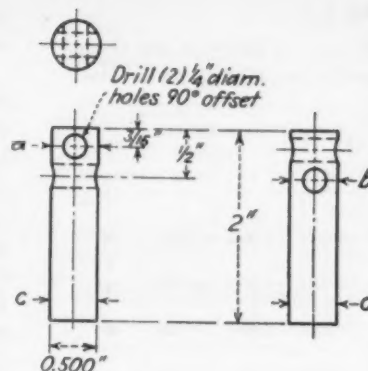
requiring about 7 hr, is all that is necessary. It is obvious, in this case, that the additional cost of heat treatment more than pays for itself.

Consider also a stamping die, which when hardened and tempered to Rc 61, may require regrinding every 40,000 stampings, while at Rc 62, 70,000 pieces can be made without interruption. Again it is clear that the savings not only in grinding time, but also in fewer production shut-downs, immediately outweighs the extra cost of adding a subcooling to the heat treatment.

These examples were selected as being conservative. If a special treatment can avoid cracking of a piece, which has cost several hundred dollars in labor (such checks may often go unnoticed until the part goes into service) or if the life of a tool which does not lend itself to regrinding (an engraved hub, for example) is nearly doubled, then the facts are too heavily in favor of special treatment to need discussion.

In order to determine to what extent a so-called special treatment actually improves hardness, reduce distortion and avoid failures, the author decided to run some heat treating experiments on tool and die steels in the laboratory of B & S Metallurgical Service, Ardsley, N. Y. The fol-

FIG. 1—A special experimental tool steel specimen, $\frac{1}{2}$ in. diam x 2 in. long, designed for the purpose of determining the influence of various heat treatment variables such as preheating, austenitizing, quenching and subcooling on distortion, shrinkage and cracking.



lowing text describes the results of these tests.

Soaking at austenitizing temperature. The fact that nonhomogeneous austenite tends to start to transform more rapidly than if the steel structure is uniform, may lead to the belief that soaking prior to quench is not desirable. Moreover, frequent references in the literature to grain coarsening and consequent embrittlement, tend to make the heat treater shy away from holding his work at quench heat in the furnace.

It is known however, that in certain steels it is necessary to allow time for the carbides to dissolve and the austenite to homogenize in order to obtain proper hardening response. For instance, when martempering 9/16 diam x 1 in. long samples of oil hardening high-carbon, high-chromium die steel (2.2 C, 12 Cr, 0.8 V) the following average results were found:

- (1) Heated to 1800°F for 10 min (without preheating)—56 Rc.
- (2) Preheated to 1250°F, heated to 1775°F and soaked for 30 min—62 Rc.

Similarly, on air hardening tool steel samples of the same size the following averages were determined:

- (1) Heated to 1800°F, held for 10 min (without preheating), air quenched—57 Rc.
- (2) Preheated to 1250°F, heated to 1800°F, held for 30 min, air quenched—59.5 Rc.

Preheating prior to austenitizing. Procedures (1) and (2) differ not only in the length of time at austenitizing temperature, but also in the fact that the latter groups of samples were preheated near the transformation temperature. This is done to minimize distortion, but, it has no essential effect on hardening response.

To check on this point, several samples of high-carbon, high-chromium steel (2.1 C, 12.5 Cr, 0.5 Ni), $\frac{1}{2}$ in. diam x 2 in. long, were treated as follows:

- 1st group: Preheated to 1400°F, austenitized at 1775°F for 30 min, quenched in oil at room temperature—63 Rc. Preheated to 1400°F, austenitized at 1775°F for 30 min, martempered by quenching to 430°F, holding for 15 min, and air cooling—63 Rc.

2nd group: Specimens charged into furnace at 1800°F (without preheating), austenitized for 30 min, quenched in oil at room temperature—63 Rc. Specimens charged into furnace at 1800°F (without preheating), austenitized for 30 min, martempered by quenching to 430°F, holding for 15 min, and air cooling—62.5 Rc.

Thus, it was proved that for these steels the resulting hardness was not affected materially by the method of heating.

Upon further study of the subject of preheating, it was found that some authors do not feel that this practice is beneficial for avoidance of distortion or cracking.¹ The reason given is that a tool will never be more than 100° hotter on the outside than inside even when charged directly into the furnace at full hardening temperature. It was decided to run a group of experiments to check this effect of preheating. For this purpose a special specimen was designed. Considerable sectional changes were purposely built into it on one side, while the other end was left solid. In an effort to make the specimen readily machinable and inexpensive this was accomplished by two holes drilled at 90° to each other leaving thin walls near the edges, heavier walls in the center of the bar and at the end. This design is shown in fig. 1.

Oil hardening high carbon, high chromium steel (2.1 C, 12.5 Cr, 0.5 Ni), was selected for this investigation. Diameters *a*, *b* and *c* of fig. 1 were carefully measured and recorded for each specimen before and after hardening. In table I the average changes are recorded.

For the steel tested and under the conditions used there seems to be no advantage in preheating. No cracking was observed on any of the pieces. No conclusive difference exists in size changes between the two methods of heating. In fact, the samples charged directly into the quench heat, appear to have distorted somewhat less than the ones carefully preheated.

Methods of quenching. As just indicated, martempering and air cooling was one of the quenching methods tried in these experiments. Other

TABLE I

Effect of Heat Treatment Variables on Distortion and Cracking of an Oil Hardening, High-Carbon, High-Chromium Steel.

Condition	Hardness, Rc	Changes in Diameters, ¹ In.			Cracked
		a	b	c	
Preheated, austenitized, and oil quenched	63	+0.0001	+0.0004	+0.0004	No
Charged into hot furnace and oil quenched	63	+0.0003	+0.0005	+0.0004	No
Preheated, austenitized, martempered	62.5	-0.0005	-0.0002	-0.0002	No
Charged into hot furnace and martempered	63	0.0000	+0.0001	0.0000	No

¹ See Fig. 1.

TABLE II

Influence of Oil Quenching and Martempering on Hardness and Distortion of a High-Carbon, High-Chromium Steel.

Condition	Hardness	Diameter, In.
As delivered	97 Rb	0.5628
As oil quenched	64.5 Rc	0.5636
As martempered and air cooled	63 Rc	0.5630

TABLE III

Influence of Oil Quenching and Martempering on Hardness and Distortion of a High-Carbon, High-Chromium Steel, As Tempered

Condition	Hardness, Rc	Diameter, In.
As oil quenched and tempered at 420° F	60	0.5634
As martempered and tempered at 420° F	60.5	0.5628

TABLE IV

Effect of Quenching Practice on Hardness and Distortion of an Air Hardening, High-Carbon, High-Chromium Steel.

Condition	Hardness, Rc	Diameter, In.
As delivered	.....	0.5627
Oil quenched (room temperature)	62	0.5635
Martempered at 440° F for 15 min; air cooled at room temperature	62	0.5632
Quenched in still air	59.5	0.5629

TABLE V

Influence of Heat Treatment on Hardness and Distortion of a Tungsten-Bearing Oil Hardening Tool Steel.

Condition	Hardness	Diameter Ends	Diameter Center
As delivered	95 Rb	0.5626	0.5626
Quenched in water at room temperature	65 Rc	0.5645	0.5650
Quenched in oil at room temperature	64.5 Rc	Cracked; diam could not be measured accurately	
Quenched in oil at 120° F	63 Rc	0.5639	0.5642
As martempered at 430° F for 15 min; air cooled	63 Rc	0.5635	0.5635

methods tried were air cooling, water quenching, oil quenching from martempering, etc.

In a first group of experiments in this series, high carbon, high chromium steel (2.2 C, 12 Cr, 0.8 V) was used. As delivered, this steel has a hardness of RB 97 or RA 59. The diameter measured 0.5628 in. centerless ground by approximately 1 in. long. The literature reports the M. point at 440°F and the austenitizing temperature at 1800°F, while the time required for transformation at 445°F is 1½ hr.² Consequently, the martempering procedure was selected as follows: Quench to 440°F, hold for 15 min in well agitated bath, then air cool. The material was preheated at 1250°F before raising the temperature to 1775°F. Hardness readings and diameters obtained (averages of several specimens and several measurements on each), are listed in table II.

Although information is available on the advantages of martempering, the references are frequently concerned with low alloy steels, such as SAE 52100, 4600, 4150, etc.³ It was decided, therefore, to explore the advantages of martempering on tool steel.

As can be seen from table II, greater dimensional control is possible with martempering than in cold oil quenching; however, due to the self-tempering effect of martensite, the hardness is lower. It must be remembered that the measurements were taken as-quenched and that a slight shrinkage may be expected in tempering, as indicated in table III. These values indicate that the hardness advantage of the oil-quenched specimens was lost in tempering. This might be explained by the self-tempering effect of air cooling from the martempering bath. It is of interest to note, however, that the martempered specimens shrank, so that the diameter was actually the same as the bar as-supplied. These trends are significant, but since some of the differences in observed values are close to the limit of accuracy in measurements, it cannot definitely be stated that no change in size will take place after martempering and tempering according to the process used here. Especially on larger or more intricate tools the conditions may not be as favorable.

In a second group of experiments, an air-hardening type high carbon, high chromium steel (1.5 C, 12 Cr, 0.8 Mo) was used. The A_{cs} point is listed as 1490°F, and M. as 440°F. Readings taken on 1-in. long specimens, austenitized at 1850°F for 30 min subsequent to preheating at 1250°F are given in table IV.

In this series, lower expansion is accomplished by martempering, combined with equal hardness as in oil quenching. Air quenching, on the other hand, effects still lower expansion with a sacrifice in hardness.

The third group of experiments in this series was carried out with a tungsten-bearing oil hardening tool steel, containing 1.2 C, 1.6 W, 0.7 Cr, and 0.25 Mo, furnished in the form of centerless ground bars. As delivered, the material had

a hardness of 95 RB and a diameter of 0.5626 in. Some of the results are summarized in table V. Specimens were austenitized for 30 min at 1600°F.

From these results it can be seen that for this type of steel, martempering results in lowest expansion; distortion is reduced to a minimum.

Air hardening punch and die steel of the 1.0 C, 5.25 Cr and 1.1 Mo type was used in the fourth group, and the results are indicated in table VI. All three quenching methods yielded the same hardness for all practical purposes. The martempering temperature was selected below the M. point, to establish whether lack of expansion and distortion might be accomplished without sacrifice in hardness. Actually, the size change is the smallest among the quenching methods tried here, but there was some distortion in the opposite direction from that recorded in the other groups in that the center of the specimens was smaller in diameter than the ends.

These findings made it appear important to further investigate the matter of distortion and crack-free quenching by the martempering process. For this purpose the special specimen described earlier and shown in fig. 1 was utilized. With this specimen the fifth group of runs was made on an oil-hardening high-carbon, high chromium steel containing 2.1 C, 12.5 Cr and 0.5 Ni. The heat treatment consisted of preheating to 1400°F, austenitizing at 1775°F for 30 min, and quenching. Experimental results are presented in table VII. The fact that actual shrinkage took place in martempering may be explained as follows; (1) slow cooling permits a certain amount of self tempering of the martensite, and (2) there is some untransformed austenite present. The latter point is discussed below, in an evaluation of results obtained by subcooling.

The shape of the specimens was purposely designed to favor cracking, if the treatment would involve such a tendency, but no failures were observed in this group.

Effect of subcooling. In die work, where wear resistance is of utmost importance, every point on the hardness scale counts. In molding of metal powders, for instance, a die having Rc 60 hardness may stand up for 150,000 pieces, while an identical die, heat treated to Rc 61 would yield an output of at least 250,000 pressings. Similar operating data can be found in other industries. Every possibility, therefore, to bring up the as-quenched hardness should be utilized. After tempering at a temperature sufficiently high to relieve all strains and improve toughness, the higher the hardness the longer the life of the tool.

A factor which interferes with the attainment of maximum hardness is retained austenite after quenching to room temperature. The amount retained depends a great deal on composition, as well as austenitizing and quenching conditions. In the steels considered in this article, the percentage of retained austenite as commercially

TABLE VI

Influence of Heat Treatment on Hardness and Distortion of an Air Hardening Punch and Die Steel.

Condition	Hardness, Rc	Diameter Ends	Diameter Center
As delivered	.....	0.5627	0.5627
Quenched in oil at room temperature	63.5	0.5635	0.5643
Quenched in air	63	0.5635	0.5635
Martempered to 360° F; slow cooled	63	0.5634	0.5629

TABLE VII

Comparison Between Cold Oil Quenching and Martempering as Regards Hardness and Distortion of an Oil Hardening, High-Carbon, High-Chromium Steel.

Condition	Hardness, Rc	Change in Diameter, in.		
		a	b	c
Quenched in oil at room temperature	63	+0.0001	+0.0004	+0.0004
Martempered 440° F for 15 min; cooled in air	62.5	-0.0005	-0.0002	-0.0002

TABLE VIII

Effect of Subcooling on Hardness of Three Die Steels.

Steel	Hardening Treatment	Hardness, Rc	
		As Quenched	As Subcooled
Oil hardening 2.2 C, 12.0 Cr, 0.8 V	Quenched in oil; martempered 440° F; air cooled	64 63	65 65
Air hardening 1.5 C, 12 Cr, 0.8 Mo	Air quenched; martempered 440° F; air cooled	59.5 62	61 63
Oil hardening 1.2 C, 1.8 W, 0.7 Cr	Oil quenched; martempered 430° F; air cooled	63.5 63.0	66 64.5

TABLE IX

Effect of Subcooling on Dimensional Stability of Three Die Steels.

Steel	Hardening Treatment	Dimensions, in.	
		As Quenched	As Subcooled
Oil hardening 2.2 C, 12.0 Cr, 0.8 V	Quenched in oil; martempered 440° F; air cooled	0.5003	0.5010
Air hardening 1.5 C, 12 Cr, 0.8 Mo	Air quenched; martempered 440° F; air cooled	0.5629 0.5632	0.5635 0.5638
Oil hardening 1.2 C, 1.8 W, 0.7 Cr	Oil quenched; martempered 430° F; air cooled	0.5637 0.5635	0.5647 0.5645

heat treated is surprisingly high. In high-carbon, high-chromium steels or medium-chromium air hardening steels, between 15 and 30 pct of the austenite remains untransformed and is, therefore lost to the hardening reaction. Because martensite forms upon cooling and continues to form the lower the temperature drops, a definite M_s point is difficult to establish. In practice, then, it should be possible to increase hardness by cooling the steels below room temperature so that additional martensite is formed. This has been demonstrated but is not often utilized in commercial heat treatment.

Data presented in table VIII show how cooling die steels to -110°F after various quenching treatments brings out the all-important extra point on the Rockwell C scale.

Reference was made previously to the fact that lack of expansion or actual shrinkage on quenching is at least in part due to retained austenite. It should be possible to detect formation of additional martensite, resulting from subcooling, by expansion (see table IX). There was not a single exception to the general expansion behavior in subcooling. It appears that quenched specimens grow by about the same amount as those that are martempered. The amount of re-

tained austenite appears to be about in the same order of magnitude.

In summarizing, it can be stated that for the steels tested and under the conditions used: (1) It was necessary to hold the work at the quenching temperature for about 30 min in order to attain full hardness; (2) preheating near the transformation point did not materially affect hardness; (3) heating directly to austenitizing temperature without preheating did not lead to cracking or greater distortion; (4) martempering resulted in lower expansion than oil quenching at a slight sacrifice in hardness; (5) air quenching resulted in lower dimensional changes than martempering but at a noticeable loss in hardness; (6) additional austenite was made to transform upon subcooling, as evidenced by slight but uniform expansion, and (7) by subcooling the hardness as quenched could be raised from 1 to 2 points in the Rockwell C scale.

¹ Palmer and Luerssen, "Tool Steel Simplified," 1948, p. 476.

² C. T. Wilshaw, "Isothermal Heat Treatment for Precision Hardening," *Metallurgia*, November 1948, p. 3.

³ R. H. Aborn, "Martempering," *Metal Progress*, January 1949, p. 65.

⁴ Morris Cohen, *Trans. ASM*, 41, 1949, p. 35.

Plugging Cylinder Liner Core Holes

SPECIAL machines for mass production of one part or for a limited series of machining operations have grown rapidly. A recent installation of a three way, four-station, hand indexing machine at the Electro-Motive Corp. plant in LaGrange, Ill., is typical of these highly specialized machines.

This machine is used to core-drill, tap and drive 1 in. standard pipe plugs into the cylinder liners for railroad diesel engines. The holes in the 150 lb gray cast iron casting can be seen in the accompanying illustration. These holes, three on each side, are core support holes resulting from foundry practice. The casting could be produced without core holes, but engineers of this GMC division have found the castings can be made stronger and sounder by more extensive use of cores. There are no chills in the casting.

The six holes must be plugged. Previous to buying this new Greenlee machine, the practice was to drill, tap and drive the plug using three vertical drilling machines and a plug driver, employing four operators. Floor to floor time is the same as the old practice, but man-hours per part have been reduced 75 pct because only one operator is required.

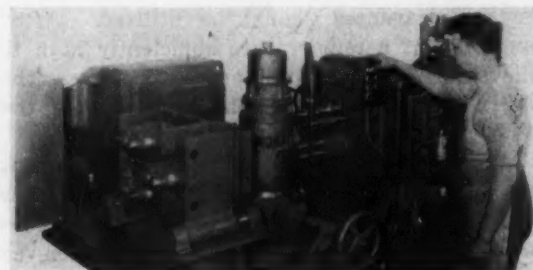
The castings are loaded by jib crane, slipped over a large spindle that automatically centers the piece. The operator pushes the first control button and the three core drills at the back station start their cycle. As they retract the operator hand indexes the part, which rotates clockwise to the next station. The second button starts the tapping cycle. As the taps retract the part is again indexed $\frac{1}{4}$ turn. The core drills again

come in to drill the three holes opposite those already drilled and tapped. As the last three are being drilled the operator hand starts the pipe plugs in the tap holes facing the front of the machine.

When the core drills retract the second time, the part again rotates 90° and the plug drivers in the left hand station drive the plugs as the taps on the right hand station finish machine the three holes on the other side of the casting.

Two more index turns, to start the plugs and to drive them to a definite torsion, complete the entire cycle. During these two operations the drill and tap stations are idle.

Air motors drive the plug wrenches while the drills and taps are directly gear driven by one 10 hp electric motor. Electro-Motive Corp. requires about 125 such cylinders each day to meet present production schedules. The machine made by Greenlee Bros. & Co., Rockford, Ill., permits meeting these schedules with a minimum number of men and considerable savings in floor space.



Core drilling, tapping and driving 1 in. pipe plugs in diesel engine cylinder liners is done on this four-station, hand indexed machine.

Cutting Stainless

BY FRICTION BAND SAWING

By H. J. Chamberland

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THERE are three basic reasons for friction band saw cutting stainless steels. The increasing use of stainless in diversified industries demands a high speed, low cost cutting method. Stainless grades can be cut without difficulty. And most requirements for stainless sheet or plate are within the practical and economical material thickness limitations of the process.

All types of stainless steel respond well to friction band sawing, especially when compared with the difficulties and complexities of conventional speed sawing and other common cutting methods. In conventional sawing a $\frac{7}{8}$ in. plate of type 317 stainless at 75 fpm, the cutting rate would be limited to $\frac{3}{8}$ ipm, lineal cutting, and it is doubtful if band life would exceed 20 min. On the other hand, the friction band at a speed of 12,000 fpm will cut this material thickness at a rate of 13 lineal ipm, and would maintain this efficiency for at least 2 hr. The same production can be achieved in circular cutting $\frac{1}{2}$ in. plate to a radius of 12 in. with a $\frac{3}{4}$ in. band by making use of an attachment for this purpose. Such results, within the practicability of friction band sawing are beyond the possibilities of many other cutting methods. The material thickness in this case is close to the practical limit, which is 1 in. This steel has a chemistry of 20 pct Cr, 10 pct Ni and 0.75 pct max Si.

As material thickness decreases and alloying elements permit more control over heat concentration at the point of the cut, cutting rates increase tremendously. For example, these cutting rates are 9 sq in. per min in cutting the casting, type 302 stainless, shown in fig. 1; 42 ipm on a $\frac{1}{8}$ in. thick sheet of type 303 stainless, shown in fig. 2; and 100 lineal ipm on the $\frac{3}{32}$ in. thick material, type 304, shown in fig. 3. On low carbon and most free-machining steels, friction cutting rates are considerably higher and often reach 200 lineal ipm on $\frac{1}{16}$ in. sheet stock.

While friction sawing by the bandsaw method in its present stage of efficiency is relatively new, production data developed that are relative to cutting stainless sheets have resulted in dependable conclusions. Such data are shown in table I.

In cutting sheet and plate, velocities range from 5000 fpm on the thinner sheets to 14,000 fpm on the 1 in. thick type 304, speed depending upon the analysis. Different grades of stainless of identical thickness may require a varying increase or decrease from 1000 to 1500 fpm to obtain the most satisfactory cutting rate.

Contour friction sawing, common in preparing sheet and plate, has no effect on cutting velocities, but certain limitations applicable to saw width v. material thickness are imperative. A $\frac{1}{2}$ in. band will efficiently contour saw through $\frac{1}{8}$ in. material, but it will lack the back support to

Summary: Stainless steel, in both wrought and cast grades, can be economically cut with friction band sawing methods in which hardness is not a factor in establishing cutting rates. Speeds and techniques for cutting solids and tubes, as well as limitations of the process, are discussed.

resist the excessive work pressure required to slice through a $\frac{3}{4}$ in. thickness. In friction cutting, any increase in material thickness requires a proportionate increase in saw speed and feeding pressure. Consequently, there must be a safe and sound relationship between material thickness and saw width, which in turn has its effects on radius cutting.

Generally, it has been found inadvisable to attempt friction sawing with a band narrower than $\frac{1}{2}$ in. except on specific recommendation. The $\frac{1}{2}$ in. band should be limited to a material thickness of $\frac{3}{8}$ in. and to a cut with minimum radius of 3 in. The $\frac{5}{8}$ in. band will cut to a $\frac{1}{2}$ in. thickness; the $\frac{3}{4}$ in. band to a $\frac{5}{8}$ in. thickness; and the 1 in. band, standard for straight cutting, is essential for any thickness exceeding $\frac{5}{8}$ in.

In foundry work, stainless has always presented a problem in cutting off gates and risers because tool life is extremely short, with a consequent effect on production costs. For example, in a foundry producing stainless castings, although 40 pct of the sections to be cut are outside the range of friction band sawing, two friction cutting bandsaws have reduced trimming costs by nearly 50 pct.

Foundry Applications

Two advantages of friction sawing applications in foundries are savings in material through the narrow kerf and closer cutting and the fact that the high speed band can be subjected to considerable twisting without breaking. The average life of the band on stainless castings is from 6 to 8 hr, depending upon thickness of the sections cut. Another time saving factor is attributed to a set saw velocity, which proves efficient for cut-

ting sections of various thicknesses. Where stainless gates and risers are from $\frac{1}{2}$ to 1 in. thick, a standard velocity of 12,000 fpm has worked out efficiently. In foundry applications, actual friction cutting time is usually a matter of seconds.

Because castings often may be held and fed to the saw in such a way as to present a continuous thin edge, stainless steel sections up to $1\frac{1}{2}$ in. are economically cut. This fact, contrary to the limitations of the process as described, depends upon the dexterity of the operator. By lifting the casting, the top edge of the section to be cut, as shown in fig. 1, contacts the saw teeth. As the saw begins to cut, the piece is alternately lowered and raised throughout the cutting process. A piece of flat steel of similar thickness can likewise be cut by placing it on another piece $\frac{3}{4}$ in. wide x 1 in. thick to provide the necessary rocking action.

Tubing of stainless steel is easily and efficiently cut by friction band sawing. In this method of sawing tubing or pipe, there is no compromise between saw pitch and velocity to establish an economical medium between saw life and cutting rate. There is, however, the limitation of wall thickness as related to the OD of the material.

In friction sawing tubing or pipe stock, an OD of 1 in. can be friction cut regardless of the ID dimensions since this is considered a solid 1 in. section. Beyond this, wall thickness governs the situation and the larger the OD, the larger must be the ID, to keep the maximum wall thickness within the cutting range of the method. In short, the maximum wall thickness is approached only momentarily, and is reached only when the saw penetrates through the inner wall.



FIG. 1—Using friction band sawing technique for cutting gates and risers of stainless castings

Tubing of $1\frac{1}{2}$ in. OD and $1\frac{1}{8}$ in. ID has a maximum wall thickness within the friction cutting range. The same applies to a 6 in. OD x $5\frac{7}{8}$ in. ID tube. Therefore, tubing ranging from $1\frac{1}{4}$ in. to 12 in., OD, with respective wall thicknesses of $\frac{1}{4}$ in. and $1/32$ in., may be efficiently friction cut if the proper relationship between the OD and the wall thickness is maintained. In connection with stainless steel tubing, the saw velocity has about the same effect as on castings. Most tubing having a wall thickness greater than $\frac{1}{8}$ in., regardless of the OD, will respond well to velocities of 8000 to 10,000 fpm. Velocities of 5000 to 6000 fpm are sufficient when the wall thickness is less than $\frac{1}{8}$ in.

Hardness Not a Factor

One outstanding feature of friction sawing is that the hardness of the material is not a factor and skin hardness depth is negligible since it seldom exceeds 0.002 in. on the thicker cuts. Stainless steels lend themselves readily to friction sawing since they are in the group of metals having a reasonably low melting point. As the alloying elements are added, the softening characteristics are altered and this condition must be met with a variation in saw speed to generate the correct amount of heat at the saw-work point. This also applies to material thickness. The thicker the cut, the higher the velocity required to create the necessary increase of frictional heat directly in front of the saw teeth. Actually, however, with friction sawing of stainless steels, material thickness rather than alloying elements has, in general, greater effect on the variation in saw speeds.

TABLE I
Stainless Steel Friction Sawing Data

Dimension of Cut, In.	Saw Pitch	Saw Velocity, Ft per Min	Cutting Rate
Sheet and Plate			
$\frac{3}{32}$	14	6,000	72 in.
$\frac{1}{8}$	14	9,000	32 in.
$\frac{1}{4}$	10	5,000	29 in.
$\frac{3}{8}$	10	7,000	4.5 sq. in.
$\frac{1}{2}$	14	5,000	24 in.
$\frac{3}{4}$	10	5,000	22 in.
$\frac{1}{2}$ gage.....	10	12,000	16.8 in.
$\frac{3}{4}$	10	8,000	5.16 sq in.
$\frac{1}{2}$	10	14,000	12.8 in.
$\frac{7}{32}$	10	8,000	32 in.
$\frac{1}{16}$	14	6,000	125 in.
$\frac{1}{32}$	18	5,000	396 in.
Tubing			
6 x $\frac{3}{16}$ wall.....	10	10,000	20 cuts per min
1 x 0.046 wall.....	10	5,000	0.02 min per cut
$1\frac{1}{2}$ x $\frac{3}{16}$ wall.....	14	8,000	30 cuts per min
3 x $\frac{3}{32}$ wall.....	10	9,000	20 cuts per min
$2\frac{7}{16}$ x $\frac{3}{16}$ wall.....	14	8,000	0.04 min per cut
Gates and Risers			
$\frac{3}{16}$ x $\frac{1}{16}$	All cuts with 10 pitch band at 10,000 fpm		0.10 min per cut
$\frac{1}{8}$ x $\frac{1}{8}$			0.15 min per cut
$1\frac{1}{4}$ x $\frac{1}{8}$			0.19 min per cut
$1\frac{1}{4}$ x $\frac{1}{16}$			0.23 min per cut
$1\frac{1}{4}$ x $1\frac{1}{2}$			0.33 min per cut



FIG. 3—Trimming casket tops with a friction sawing rate six times that possible under conventional speed procedure. Stainless sheets under $1/16$ in. are cut as fast as they can be fed to the high speed band.



FIG. 2—Contour sawing 36 in. drum ends at an actual cutting time of 4.5 min per piece. Note ingenious circular setup whereby production is maintained at a figure only 20 pct less than if the cut were a straight one.

How Pennsylvania Railroad Uses

X-RAY

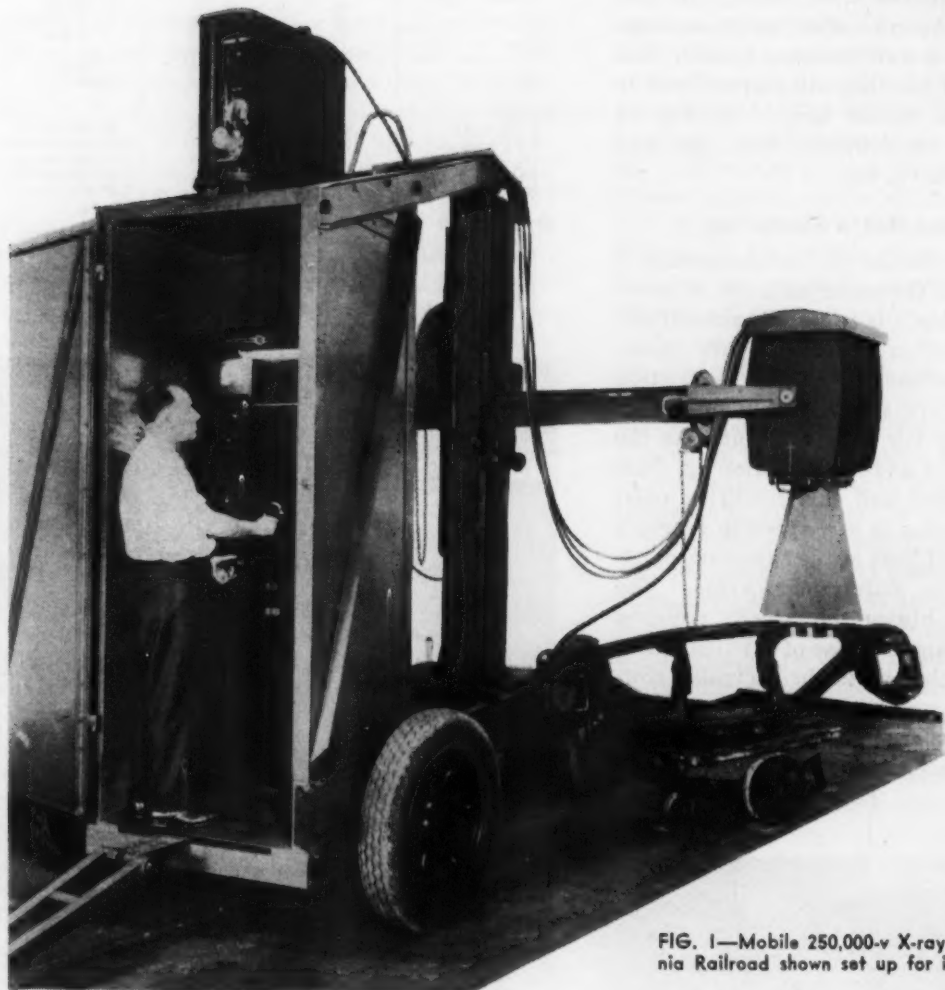


FIG. 1—Mobile 250,000-v X-ray unit used by Pennsylvania Railroad shown set up for inspecting a side frame.

IN the maintenance of railway systems, safety leads all other factors in importance. The Pennsylvania Railroad, in its Altoona, Pa., Test Department, using a mobile truck-mounted GE 250,000 v X-ray machine over the past 22 months, has proved that X-ray inspection can play a vital role in assuring safety.

In July 1947 the company built a concrete structure with walls 18 in. thick with a view to eventual purchase of a 1,000,000 or 2,000,000 v X-ray apparatus. Until such time as this unit is obtained, the 250,000-v unit is being used to explore all of the many possible applications for X ray in a railroad shop. Although presently housed in the large concrete building, it can be moved into the various shops for on-the-spot radiography. A special building is not necessary for its use, since distance affords adequate pro-

tection from units of this voltage, as proven by checks with a Victoreen pocket minometer.

Plans for the acquisition of the higher voltage machine were motivated by the fact that thicknesses of steel in excess of 3 in. are common in railway equipment, and the exploratory work on smaller parts with the 250,000-v unit indicates that X ray can also be a great aid on the quality control of larger structures.

X ray is used by Pennsylvania Railroad for three purposes: (1) To guide manufacture of both new and replacement parts of railway equipment; (2) for occasional inspection of used parts whose condition is questioned; and (3) as an aid to the purchasing department in determining the quality of products it is proposed to buy.

The 250,000 v X-ray machine used by the railroad is extremely mobile not only because it is

INSPECTION

By DAVID GOODMAN

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Milwaukee



SUMMARY: How the Pennsylvania Railroad's Altoona shops use a mobile 250,000-v X-ray unit for (1) checking pilot models of new and replacement parts, (2) inspecting used parts and (3) checking quality of purchased parts, is described by the author.



FIG. 2—This X-ray laboratory has 18-in. concrete walls which will provide adequate protection from radiation from a projected 1 million or 2 million volt unit.

mounted on a four-wheel chassis (see fig. 1) but also because the X-ray head can be easily manipulated on a jib-crane. The control panel is mounted at the rear in a lead-lined cab with sufficient room for the radiographer during the exposure. Overhead clearance required by the machine is 12 ft 6 in. When the unit is used in the shop, it is necessary to clear an area within a 75-ft radius for protection from the radiation. Where this is impossible, the uncleared area may be protected by means of portable lead partitions. A view of the concrete-walled X-ray building is shown in fig. 2.

The advantage of nondestructive testing methods over sectioning is particularly pronounced in the railroad field, where large structures are common. Production runs are rare, and X ray is used primarily as a tool of quality control

rather than for routine inspection.

The X-ray unit is operated as a function of the Maintenance of Equipment Department. This department is a division of the Operating Department, along with the Maintenance of Way and Structures Department and the Transportation Department. From the names of these organizations, their division of function is apparent. However, the use of X ray is not confined solely to the Maintenance of Equipment Department. This department is sometimes called upon by other departments to provide service. For example, it performs investigations of failures of rails for the Maintenance of Way and Structures Department, and does other test and research work for the entire railway system. One full-time man has been found to provide an adequate staff so far in the operation of the X-ray apparatus.

Two of the primary factors for the decision to use X ray were the successful precedent of governmental application and the necessity for using X ray in guiding the growing trend toward use of welded structures, particularly boilers. Some typical examples of the use of X-ray inspection at Altoona are described in the following text.

The bronze catenary clip is a small but strategic item used as part of the suspension of trolley wires in the electrified railway lines. The clip must be free of all flaws because it carries a load and is squeezed to insure a positive grip. X ray, showing up flaws clearly and unmistakable, guided and improved production process, and made it unnecessary to depend on luck, guesswork or destructive testing methods.

When the manufacturing shop wanted to compare the results from using split steel molds with those from using sand molds, X ray was employed to check for homogeneity in the material and freedom from flaws in the pilot castings. Should this study progress as planned, it may make possible the use of molding methods that are substantially less expensive, yet just as effective from the standpoint of safety and serviceability.

Reclaiming Injector Parts

A reclaimed locomotive injector part was one of the first products X rayed by Pennsylvania Railroad. It was considered desirable to insure the solidity of that portion of the part which was to be rethreaded. The worn threaded area is brazed before the rethreading job is done. Solid, clean, homogeneous material is essential in this strategic area, for otherwise the casting would leak. X-raying, which was done before the machining operation, thus not only insured the safety factor originally designed into this part, but also saved valuable machining time, which might otherwise have been wasted.

One of the most important applications for X ray at Pennsylvania Railroad is an aid in the periodic qualification of welders. While X ray itself is not the determining factor in this qualifying procedure, it can be used as a screening and confirming method to determine the level and type of work done by the welder. The X-ray appearance of a weld will show immediately whether the weld is satisfactory and would hold up under the tests.

Equalizer bars are used in passenger car trucks to transfer the load from the car to the wheels. Welding repairs on these bars were X-ray inspected to insure that the welding technique set up for reclamation is sound, judging by results on the pilot lot.

Some of the equalizer bars X rayed at first showed voids and check cracks, indicating improper preheating of the base metal and unsatisfactory cooling of the weld metal after welding. By combining magnetic particle and radiographic

studies the source of the difficulty was corrected.

Freight car truck side frame castings are an important subject for X ray, particularly in the comparatively thin tension members which carry the main load. Pennsylvania Railroad uses X ray (see fig. 1) here to do control inspection on pilot lots. Errors in casting technique are indicated by the location and nature of the flaws revealed by radiography.

Chain links provide another problem for radiography. Only 1 in. in diameter, they are difficult to examine without the use of copper blocking. X ray is used to check on the soundness of gas and electric welds and to compare the effectiveness of the two types of welds.

In locomotive boiler welding, or in the welding of pressure vessels in general, the entire weld is radiographed to insure 100 pct good welds, in accordance with the ASME code.

Checking on vendors is also a major function of X ray. In one case, the railroad was considering the purchase of steel rotary buffing wheels from different manufacturers. X ray revealed the manner in which the wires were fastened to the core (see fig. 3) and indicated which wheel would be more likely to stand up under extensive use. Safety for the operator was a more important consideration here than the durability of the wheel.

X ray showed up porosity and cavitation in the body of 1½ in. union angle valve made of cast steel, as illustrated in fig. 4. The small pilot lot was completely X rayed after this condition was found, and the casting technique changed to eliminate the condition.

Lack of fusion and penetration in the case of welds is illustrated in some pieces that are electrically butt-welded. X-ray evidence demonstrates several facts about welding: (1) welders' ability to weld varies with time, the type of product being welded, the type of welding being done, the welding process used, with the condition of the weld metal and parent metal, and with the self-application of the welder to his work on a given day; and (2) welding of new items often presents new problems that can not be anticipated in advance. Since welding is widely used by Pennsylvania Railroad in repair and replacement, a method for insuring the soundness of welds with positive, visual evidence is indispensable.

Mechanical pencils, spark plugs, and other similar assemblies are some of the diverse items which the radiographer checks for the benefit of the purchasing department. Whatever large-quantity buying is done, it is desired to know the product thoroughly before committing the organization to large sums of money. In the case of spark plugs, fig. 5, the soundness of the ceramic and the position of the electrical inserts is vital. The railroad uses this item in large quantities on trucks and gasoline engines employed in maintenance of ways and structures.

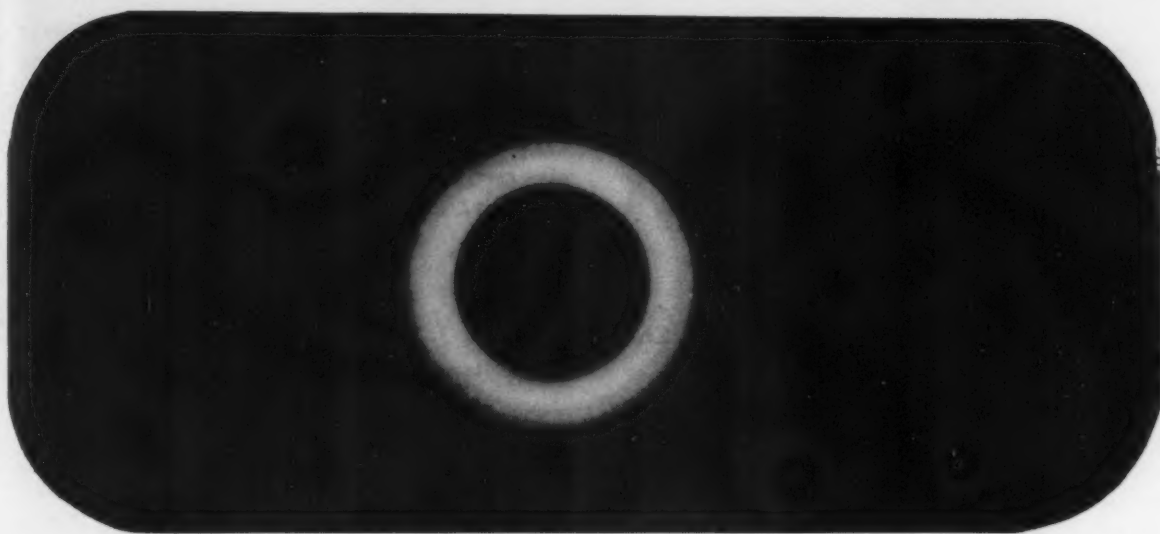


FIG. 3—Steel buffing wheels were checked by X-ray, as shown here, to determine construction of the wheels, prior to purchase.



FIG. 4—Radiograph of a cast steel angle valve, showing a small flaw.

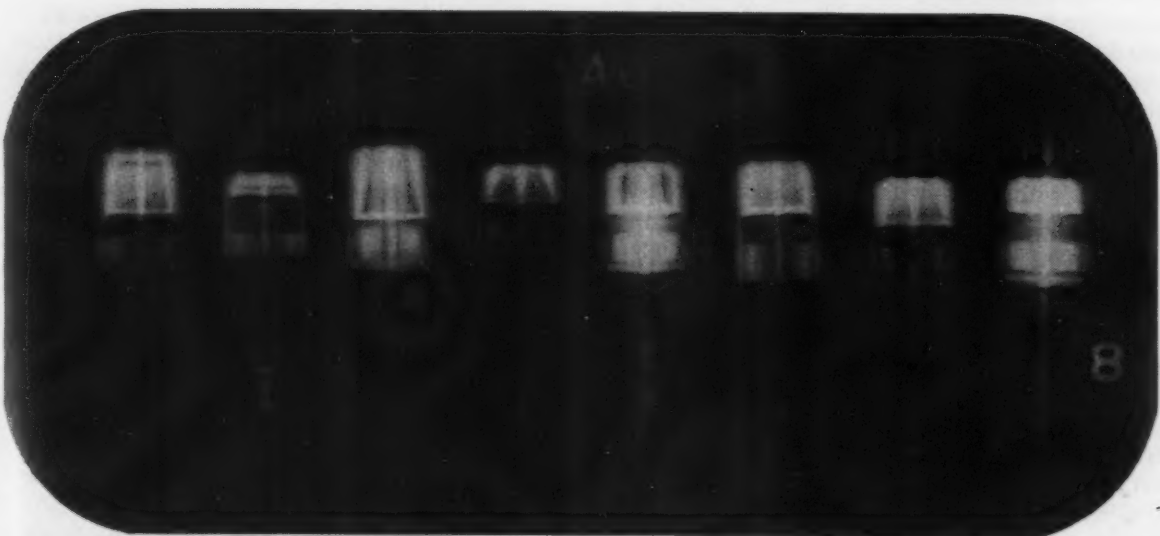


FIG. 5—A group of various types of spark plugs X-rayed to permit study prior to purchase of individual construction details.

GAS-METAL REACTIONS

By

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SUMMARY: In the study of gas-metal reactions where the products of interaction are nonvolatile and form scale on the metal surface, the measurement of reaction rates necessarily plays an important role. Various continuous and discontinuous measuring techniques—of which the microbalance and gas-volumetric methods are considered the most versatile—are described and appraised, in this concluding part of a two-part article, the first part of which appeared in the Aug. 25 issue.

EVEN a short review of gas-metal reaction fundamentals would not be complete without mentioning the most important methods of measuring gas-metal reaction rates.

The reaction rates can be measured, either in a discontinuous or a continuous manner. In the discontinuous form, the specimens are subjected to definite experimental conditions, such as the use of a specific gas and temperature, then removed after a definite time period, and the amount of the reaction determined. Each additional point on the "time v. amount of reaction" curve is obtained on a separate specimen. Therefore, wide scattering of points is a frequent occurrence, and the method should be used only if no other method can be employed. Very often the discontinuous method is used in a form where only one definite duration of exposure is used, and various metals or alloys are investigated by determining, for example, the weight increases per unit area in the same time period. This will give only a crude idea of the behavior of metals as one of the most important criteria—how the thickness of the scale changes with time—will be left undiscussed in such an experiment. Even serious errors in the estimation of corrosion rates can be introduced by using this technique if only weight increases at small thicknesses of the scale are measured.

The amount of corrosion on a sample removed from the experimental conditions can be measured in various ways. The simplest is the weight-increase method; however, care should be employed to guarantee that small fragments of the scale, which often fall off during the cooling, are not lost. To achieve this, the specimen is usually placed in a cylinder or boat of inert material, and the specimen weighed to-

gether with the cylinder. Scale can be removed by pickling²⁶ (which introduces the danger of losing small amounts of the metal by dissolution) or mechanically (a thin layer adhering to the metal is very difficult to remove, and this is usually disregarded if the scale is thick).

Campbell and Thomas⁶² developed an electro-metric reduction method of measuring thicknesses of thin, well-adhering films. The method can be used only in specific cases, such as sulfide and oxide films on copper. The principle is to reduce the film by making the specimen the cathode in a particular solution, in the absence of air. A sufficient number of coulombs of electricity are passed through the system to cause the film to be reduced, at which point the current suddenly changes; the known data then allow one to calculate the thickness of the film. Other methods of detecting the thickness of scale formed involve measuring the resistance of the film and measuring the thickness of the scale by means of a microscope micrometer after making cross-sections,¹² etc.

However, preference should be given to continuous methods of observation, of which there are several. In continuous methods, one follows the complete "time v. amount of reaction" curve on one specimen. The advantages are a saving of time and a much clearer idea of the law of scale growth. Uncertainties due to different preparations of the surface of the specimen, impurities and so on, do not influence too much the smoothness of the curve obtained from one specimen. These secondary factors become apparent only when one attempts to repeat the curve on another specimen.

Perhaps the most elegant technique is that which makes use of the microbalance. The

specimen hangs on a thin fiber of quartz glass or other inert material in the experimental space, i.e., a silica vessel in a furnace. The fiber is attached to the beam of a sensitive microbalance outside the furnace, and the increase in weight of the specimen is observed. The method has been used, in different degrees of refinement, by many workers, but has been brought to its highest accuracy by Gulbransen.⁶³ It is possible to detect an increase of thickness of scale as small as a couple of lattice cell layers. The method is simple and accurate, however, there are two serious limitations which render the method unsuitable in some cases. If an investigation in a gas mixture is to be performed, a rapid flow of gas is imperative to avoid the secondary effect of a retardation of reaction rate by the selective exhaustion of reacting gas from the stagnant gas layer around the specimen. Maintenance of gas flow clearly interferes with the weighing operation. A second limitation lies in the necessity of preparing relatively thin sheets of metals. Large bulky coupons cannot be used because of their large weight (the specimen should be of a weight of the order of 1 g). There are many alloys which are hard to prepare in thin sheet form.

The volumetric method is a way out of this second, and also, to some extent, the first, limitation. In the volumetric method, a definite amount of gas is introduced into a closed system, which contains the specimen in the hot zone of the system. As the gas and metal react, the pressure of gas decreases, and the decrease can be measured either manometrically⁶⁴ or volumetrically.⁶⁵ The sensitivity of the method can be raised at least as high as in the microbalance method. In the arrangement as used by Campbell and Thomas,⁶⁴ the increase in the scale thickness equivalent to about one monolayer of oxide cells could be detected.

Gas Purity Requirements High

There are, however, several drawbacks inherent in the method. The requirements as to the purity of the gases are very high, and the samples should be thoroughly degassed because every foreign gas which collects in the experimental space will block the access of the reacting gas to the surface of the metal and influence the rate of the reaction. Constancy of temperature during the experiment should be secured, since pressure and volume of gas change appreciably with temperature, and so the differences in pressure or volume would not correspond to the amount of gas actually consumed. By taking proper precautions and using a symmetrical system arranged so that one part of the system contains the sample plus gas, and the other, exactly similar, and placed parallel to the first part, the gas alone. Campbell and Thomas improved the method considerably.

Gas mixtures require continuous circulation

of gas, however, and in circulating systems the high potential accuracy of the volumetric or differential manometric method cannot be attained. The authors have built and operated a dynamic volumetric system (fig. 2 in part I), where the oxidation experiments were conducted in circulating oxygen at several millimeters pressure. The oxygen was circulated by a mercury vapor jet pump, and freezing traps were used to isolate the mercury vapor from the space occupied by the specimen. As oxygen consumption in the metal-gas reaction proceeded, the oxygen was supplied to the circulatory system by means of a contact manometer and a magnetically operated valve, from a thermostatted gas burette. Accuracy of the method is not influenced very much by changes in temperature along the circulatory system as the oxygen in this part of the system is at low pressure. The method is also only moderately sensitive to impurities in the oxygen as long as the oxidation at the beginning stage of the scale growth is investigated.

Use All-Glass Pumps

To permit work with technical gases and gas mixtures, a rapid flow of gas over the specimen must be maintained. One has to sacrifice some accuracy and use gas circulators in the form of all-glass magnetically-driven piston-pumps or fans. These handy devices have begun to find their way into the laboratory and undoubtedly much of the future advancement in the fields of kinetics and equilibria in gas-solid systems will be credited to the help of this new instrumentation. The circulatory volumetric system probably is the most suitable tool for use in an industrial laboratory. Summarizing its advantages, one can state: The shape and size of the specimen may vary widely as long as the surface area can be defined; technically pure gases may be employed as well as gas mixtures; the accuracy is sufficient; the method is far better than the straight weight-increase method as it supplies the whole curve of progress of the reaction in one run, on one specimen; and finally, the equipment is rugged, and, when it is once set up, the experiments require a minimum of manual work.

The electrical resistance method is the third way, although a limited one, to measure the rates of gas-metal reactions. In fact, if the rate of disappearance of the metal phase is considered as the measure of the advancement of the corrosion process, the increase in the electrical resistance of the metal specimen is the factor which measures that most directly. The method is limited, essentially, to use on pure metals because the resistance of alloys changes with change in composition. The change in composition is caused by preferential oxidation of definite constituents. A long strip or thin wire of

metal under investigation is placed in the furnace in the atmosphere of the corresponding gas. The resistance of the strip or wire is followed continuously by means of a suitable electrical circuit connected to the specimen.

With progress of the reaction, the cross-section of the metallic core decreases; the specific resistance of the oxide or other reaction product is higher than that of the metal by several orders of magnitude and can be neglected. The temperature constancy must be very good as the temperature coefficient of the specific resistance of pure metals is about 0.3 pct per °F. The method also requires that the metal be in a special form; leads coming out of the furnace should preferentially be of the same metal as the specimen and are sometimes cut as strips from the sides of the specimen, leaving one end of the outgoing strip still connected to the specimen. Only fairly advanced corrosion, amounting to several pct of the cross-section of the specimen, can be detected with a sufficient degree of accuracy, and sometimes temperature changes must be compensated for by means of such ingenious devices as used by Seeber.⁶⁶

A method of an entirely different nature is the optical method of observation of growth of scale. As long as the scale is very thin (several hundreds of Angstroms) it is frequently possible to observe interference colors caused by reflexion from the scale-metal interface and the transparency of the thin scale layer. Perhaps it would be more appropriate not to speak of scale in this case, the scale may be more properly referred to as a tarnish layer. The rate of the process is then described usually as the rate of tarnishing.

Interference Color Method

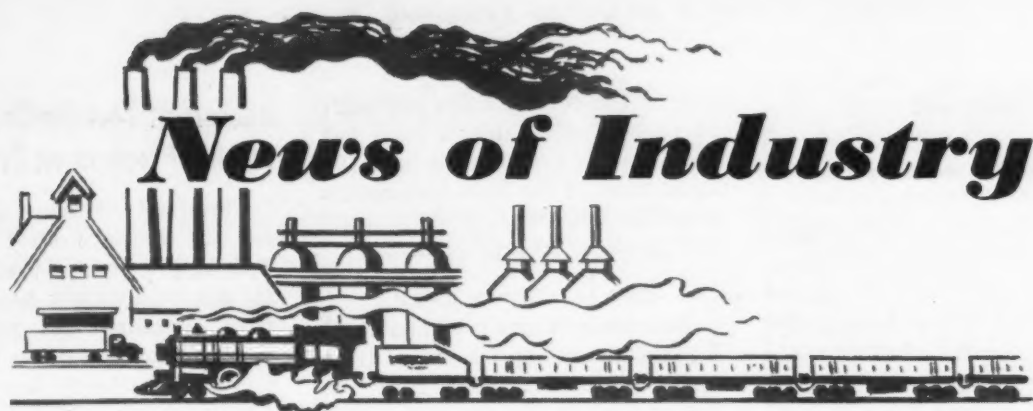
Tammann⁶⁷ was the first to apply the interference color technique to the investigation of gas-metal reactions and derived various rules of growth. Later the method was thoroughly investigated by Evans and Bannister⁶⁸ and by Constable.⁶⁹ In this country, McAdam and Geil⁷⁰ applied the method to a long series of metals. More recently Winterbottom, in England, is refining the technique.⁷¹ The method is good for following the initial stages of tarnishing, however, there is much uncertainty as to the actual thickness of the tarnish layer. The calculation requires a knowledge of the refractive index of the oxide in the state in which it is present in the tarnish layer, eventually in a stressed condition and having abnormal lattice constants. On the whole, the optical method is most suitable for comparing tarnishing rates of the same metal under slightly different conditions, but where the experimenter is sure that he is dealing with similar tarnish composition.

This short review of methods indicates that

the microbalance and the gas-volumetric methods are the most universal means of investigation of kinetics in gas-metal systems, and perhaps the gas volumetric method is the more versatile of the two. All other methods should be considered as limited to specific applications.

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These Changing Times

Pittsburgh—M. N. Landay Co., Pittsburgh, has bought steel melting facilities that were once a part of the Crucible Steel Co. Park Works from Deere & Co., Moline, Ill.

The four openhearth, two electric furnaces, scrap yard and other equipment will be salvaged unless someone can be found to buy them intact.

Deere & Co. bought the plant less than a year ago when steel supply was short.

Marshall Plan Countries To Swap Technicians and Data

Washington — Marshall Plan countries have finally decided to swap technicians and technical data among themselves.

A new five-point program, similar to that already in effect for the United States and Western European nations, is expected to go into effect sometime this autumn.

The intra-European program will include the exchange of documents, statistics, technicians, and research, as well as consultation of technical assistance projects, the Economic Cooperation Administration said in announcing the program.

Like ECA's technical assistance program, which provides for exchanges of U. S. and European technicians and technical information, the European project's purpose is to help increase productivity among members of the Organization for European Economic Cooperation.

Iron Ore From Quebec-Labrador Seen Closer

Hollinger-Hanna men are still proving more tonnage . . .

No government cash is expected for building of railroad

. . . Ore is believed 5 years away—By TOM C. CAMPBELL

New York—The vast Quebec-Labrador iron ore deposits are coming closer to more definite development. There is much still to be done. No papers have been signed, but the whole project looks better.

A year ago 325 million tons of high grade ore were proven. The cost of the railroad and other facilities was placed at \$200 million. A big sum for any purse.

Still Proving More

Jules Robert Timmins of Hollinger Consolidated Gold Mine, Ltd., and George Humphrey of the Hanna interests were not willing to start the railroad until they had better assurance that the ore would be taken by American concerns. More progress has been made in getting companies in the United States actively interested.

All this season Hollinger-Hanna men have been prospecting for more ore. That work has gone on between the strikes proven a year ago. It has also included other areas within the two concessions. What has been found has not been announced. But a lot more ore was uncovered.

The crux of the matter now is

the need for more proven deposits. Doc Retty, chief geologist for the Hollinger iron ore subsidiaries, is certain the total ore to be proven will be far greater than the 325 million tons announced last year.

When and if greater tonnages of ore have been officially proven it will be easier to get private financial backing necessary to build the railroad. More ore means less investment per ton.

No Government Cash

There is little chance that the Canadian government will come through with the cash to build the railroad. It will be a gigantic task

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Will Resume Iron Smelting

Dallas—Lone Star Steel officials told THE IRON AGE they expected to have their blast furnace back on about the first week of October. The company had been forced to close its furnace Aug. 8 because of lagging pig iron sales.

Mining operations in the ore pit have also been suspended. But the coke plant is continuing at 50 to 60 pct operations.

Quebec-Labrador Ore

Continued from Page 97

but those in on the project know that well. If the road is built at all it will probably be with private capital. Those who are interested in getting the ore 5 or more years hence wouldn't like to see a government agency owning and operating the railroad.

The role of government will not be subsidizing the railroad. It will probably be making sure that high taxes and other governmental gimmicks don't frighten away the capital that will be necessary to develop this project.

U. S. Firms Interested

A few weeks ago real interest was shown by four large steel companies from the U. S. Men from Republic Steel, Armco, Inland and Wheeling Steel went to Burnt Creek, the site of the camp of the Quebec-Labrador development. What they saw made them more interested. It is logical for Republic Steel to be most interested in this ore. That they are. They are ready to be shown. When they are shown they will probably do something about it. And so will the other companies which were on the recent trip. Bigwigs from Hollinger-Hanna went along with their facts and figures.

Other steel firms which have to be classed as interested in the Quebec-Labrador development are U. S. Steel and Bethlehem. The policy of the U. S. Steel Corp. has always been one of interest no matter where ore has been found. The same policy applies to Bethlehem Steel. Gene Grace, that company's head, has repeatedly said that he was interested in ore anywhere in the world.

Jones & Laughlin people weren't on the special junket to the Canadian jackpot. But their people were up that way, and far North of there, during the month of August. What they saw impressed them. While they have made no commitment of any kind for the Hollinger-Hanna project, they are

still on the outside circle and can't be counted out. Inland Steel has been casting eyes on ore land 100 miles west of the Hollinger-Hanna property but they probably won't find much in that direction.

Ore Is 5 Years Away

Best guess is that it will be about 5 years before any ore moves from Quebec-Labrador. But it is no longer a guess that the major steel firms in the U. S. will be taking their share of it—as a supplement to the Mesabi and the taconites which will be large also.

Chateaugay Mine Will Yield 25 Million Tons Low Phos Ore

Malone, N. Y.—Republic Steel Corp. some time ago decided to drill a new shaft for additional low phos iron ore near here. Plans have been changed. The company has proceeded with the open pit mining of Chateaugay iron ore which ultimately will produce about a million tons of ore. But to get to the bigger tonnage of low phos another method has been decided upon.

To cut costs and still develop new deposits which have been spotted additional ore veins will be reached by crosscuts from the old shaft at the Lyon Mountain Chateaugay mine. When the crosscuts are completed and the new development well under way, the potential will be 25 million tons of low phos ore.

The old mine is fairly well worked out, with but 6 million tons yet to be mined. But by crosscutting to the new location the supply of low phos ores is assured for years to come. Beneficiation is done at Lyon Mountain. The finished product is shipped to Troy, N. Y.

Gets Indiana Appointment

Chicago — Harvey G. Hensel, safety director for the western district of The Youngstown Sheet and Tube Co., has been appointed a member of the General Advisory Council to the Indiana Div. of Labor by Gov. Henry F. Schricker.

Backers of Taconite Ore Making Progress on Projects

Cleveland—Backers of taconite for the nation's steel mills are making progress on their projects. It was pointed out here that the part taconites will play is the same as the ore deposits in Canada and in South America—supplemental supplies to the Mesabi ores which will last much longer with this kind of help.

Armco and Wheeling with Oglebay Norton are well on their way with a pelletizing method of beneficiation. Approximately 35,000 tons are being made. When that is completed the material will be run through a blast furnace and accurate checks made on the experiment.

The excitement over the ore shortage has died down. But most steel people know that some time in the next 5 or 6 years more definite plans will have to be made to dovetail taconites, Canadian ore, South American material and ore from other sources into the whole national picture. It is thought that it can be done in view of the experimenting now going on and the proven reserves in the two new North and South America fields.

Hold Seminars for French

Philadelphia — The first of a series of seminars designed to acquaint representatives of France's heavy electrical equipment manufacturing industry with the most modern American production techniques convened here last week.

The seminars will cover all phases of engineering, production and manufacturing. Visits to the various departments of plants in this area will supplement the lectures by leading American electrical engineers and management specialists. Full discussions of labor relations will also be included in the agenda. The discussions will be conducted by ECA's Office of Labor Advisors and other American labor officials.

New England Steel Mill Hopes Get New Life

Major steel company considers building a mill in New England . . . Consulting engineer outlines plan . . . Would use Quebec-Labrador ore—By BILL PACKARD

Boston—A major steel company is considering construction of a \$200 million plant in New England to process high-grade ore from Labrador. This startling announcement was made by John E. Kelley, internationally known consultant mining engineer, in a report to the Industrial Development Committee of the New England Council here last week.

Mr. Kelley has been retained by the council to investigate the feasibility of building an integrated steel mill somewhere in this six-state area, and also to open discussions with any steel producers who might be interested in the project.

Didn't Name Company

He has recently returned from an investigation of progress made in developing and proving the big iron ore deposit in Quebec-Labrador by "Hollinger-Hanna-Republic interests." He made a similar trip for the council about a year ago.

Mr. Kelley didn't name the steel company involved. But he did say that the plan was meeting with favorable consideration from the steel company, and also from financial interests.

Another source close to the council said that the field of possible steel plant operators hadn't been narrowed down to one company. He said he believed a plant would be built. But he stressed the fact that no agreement had been reached with any company. That conversations would be conducted with any producer interested in the plan.

Here is how the plan shapes up as presently outlined:

(1) An integrated steel mill

of 1 million tons annual capacity would be built at a cost of \$200 million.

(2) The mill would directly employ about 10,000 to 12,000 people. It is estimated that it would create jobs for 50,000 more workers in other Yankee metalworking plants. About 36 pct of the area's industrial manpower is presently employed in metalworking industries.

(3) Raw materials requirements are outlined like this: All six states have "unlimited amounts" of commercial limestone. Ore would come from Labrador; coal, by water from Virginia. Although it takes 17,000 gal of fresh water to make a ton

ENGLISH VISITORS: Sir Charles Goodeve, director of the British Iron & Steel Research Assn., arrived recently in Montreal on the Canadian Pacific liner Empress of Canada. Sir Charles will tour Canada and the United States in connection with his work. Former Winnipeggers, Sir Charles and his family are pictured on board ship.



Background Information

New York—Both the New England drive for an integrated steel mill and the Quebec-Labrador ore development have been previously reported by THE IRON AGE. If you desire more background information to supplement these latest developments, it is suggested that you refer to previous stories on these subjects.

For a full report on Quebec-Labrador ore see THE IRON AGE, Nov. 4, 1948, p. 155. A complete discussion of New England's campaign for a steel mill can be found in THE IRON AGE, Jan. 27, 1949, p. 109.

of steel, this will be available if the plant is located near the mouth of one of the rivers. (Information on possible plant sites is being collected, and the final selection will be made by the producer).

(4) Products produced would probably be restricted to sheets, strips and hot-rolled rods in order not to compete with present manufacturers of wire and other products.

Labrador Ore Cheaper

More than 325 million tons of iron ore richer than that of the famed Mesabi Range have already been proven in Quebec-Labrador. Mr. Kelley said that this ore can be laid down in New England at prices from 75¢ to \$1.25 a ton cheaper than those quoted for Mesabi ore now laid down at Duluth.

He said that the 360-mile railroad linking the Labrador deposit with Seven Islands on the Gulf of St. Lawrence couldn't be completed before 1953. Hence, alternate sources have been studied. These include Newfoundland, which now sells ore to Britain in million ton lots, and Venezuela. But he is of the opinion that Canadian ore will be used because of (1) national security in wartime and (2) the council is anxious to maintain the closest possible relations with the people of southeastern Canada.

He said some of the money spent in Canada will return in trade.

INDUSTRIAL SHORTS

CONGRATULATIONS! — The CINCINNATI BICKFORD TOOL CO., Cincinnati, manufacturers of upright and radial metal drilling machines, is celebrating their seventy-fifth anniversary this year.

FOR YOUR APPROVAL—Proposed standards for the packaging, loading and overseas shipping of iron and steel products are now being circulated for approval in the trade by the NATIONAL BUREAU OF STANDARDS. It was prepared by the American Iron & Steel Institute in cooperation with NBS.

SELLING SURPLUS — Office D'Aide Mutuelle (Oma), Brussels, has announced the appointment of ASSOCIATED COMMODITY CORP., New York, as their exclusive agent for North and South America to dispose of Belgian surplus materials and equipment valued in excess of \$75 million. Associated Commodity Corp. is under the direction of Bernard Fabrikant, president, Fabrikant Steel Products Corp., and Milton Levenson, president, Miles Metal Corp.

HELPING NATURE — Export orders totaling at least \$7 million, and may run as high as \$10 million, from Argentina, Turkey, Yugoslavia and Italy; has been announced by DRESSER INDUSTRIES, INC., Cleveland. The sales consist chiefly of equipment to increase the availability of petroleum products and natural gas, bringing to these nations more of the benefits of their own natural resources.

FRENCH ORDER—Societe Lorraine de Laminage Continu, a privately-owned association of nine French steel firms, has just placed an order for \$9½ million of electrical steel mill equipment with the WESTINGHOUSE ELECTRIC INTERNATIONAL CO., New York. The order is for two new steel mills at Hayange and Ebange in northeastern France.

DUST CONTROL — Announcement has been made of the formation of MECHANICAL INDUSTRIES, INC., at Pittsburgh. The firm's activities will be limited to industrial ventilation, smoke, dust and fume control. Morton I. Dorfman, formerly with American Wheelabrator & Equipment Corp., will be president and general manager.

AUCTION SALE—DEFIANCE MACHINE WORKS, Toledo, has announced that its machinery and equipment has been sold to an undisclosed purchaser who has arranged with the Industrial Plants Corp., Chicago, to dispose of it at a public auction sale on Sept. 20 and 21. The land and buildings, comprising 175,000 sq ft, are available for sale or lease.

SAMPLE SERVICE—A special department devoted solely to constructing full-sized models of welded wire or wire and strip steel assembling has been set up by E. H. TITCHENER & CO., Binghamton, N. Y.

BEAN BUILDING—The H. K. Ferguson Co., Cleveland, have been awarded a contract by MORRIS BEAN & CO., Yellow Springs, Ohio, for the engineering and construction of a new 60,000 sq ft aluminum precision molding foundry.

GLOBE FITTINGS — John A. Rhodes Co., Inc., Springfield, Mo., has been appointed by GLOBE STEEL TUBES CO., Milwaukee, as a distributor of their seamless welding fittings and flanges.

IN BUSINESS—The warehouse at 2737 E. Walnut St., Pasadena, is the home of the newly established PASADENA STEEL & SUPPLY CO. Executive manager is B. J. Slattery with John Curb as his assistant. The company will aim to supply industry in the San Gabriel and San Fernando Valleys, absorbing delivery costs as far as San Bernardino.

New ECA Authorizations Go Chiefly to Italy, France

Washington — Additional procurement authorization totaling \$111,296,000 was announced recently by the Economic Cooperation Administration. This brought cumulative authorizations for Europe to \$6,421,656,000.

The total for industrial commodities was \$56,694,000. The commodities covered a wide range, including agricultural equipment, industrial machinery, electrical apparatus, nonferrous metals, metalworking machinery and machine tools.

Some of the larger single authorizations included, for Italy, \$5,410,000 for machine tools, \$3,859,000 for construction and mining equipment, and \$3,300,000 for iron and steel mill materials, steel mill products and ferroalloys; and, for France, \$3,200,000 for machine tools.

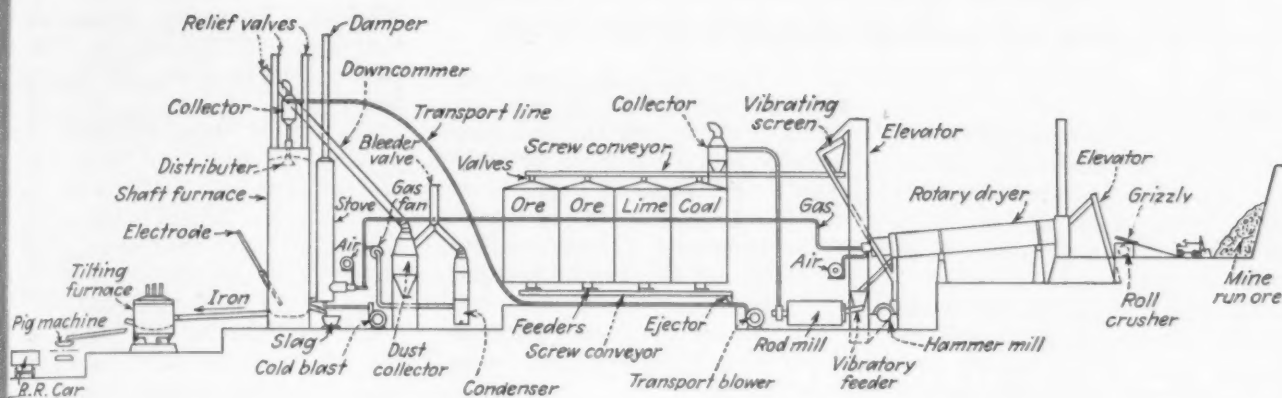
Barium Issues Periodic Reports

New York—Barium Steel Corp. now gives its stockholders periodic reports on the company and its products. Its president, Joseph A. Sisto, stresses the development of a corporate neighborhood and a reciprocal attitude among the 19 subsidiaries. (With acquisition of the Phoenix interests the number will be 20 or 21.) The forthcoming issue is planned to synopsize Barium's export business and new product development.

Spending More for Research

Chicago — At the close of the first three quarters of the 1948-1949 fiscal year, Armour Research Foundation of Illinois Institute of Technology's research volume surpassed the total for the entire previous year. In 1948 the foundation did a gross volume of research amounting to \$3,379,000 and projected figures indicate the foundation will do better than \$4,250,000 worth of research this year.

Ohio Firm Reveals Details of Its New Shaft Type Electric Blast Furnace



Canton, Ohio — The first published schematic diagram of the electric furnace silvery iron plant of Cascade Iron Corp., Canton, Ohio, which aroused wide interest a few months ago is shown here. It is located at Newcomerstown, Ohio, within 15 miles of the black-band iron ores of Tuscarawas and adjacent counties. T. F. Baily is president of the firm.

Making 15 pct silvery iron the furnace has a rated capacity of 25 tons a day, or double that if it produces foundry iron. About 4 net tons of iron ore are required to make a ton of pig iron and 3½ tons of ore to make a ton of 15-pct silvery iron.

Materials handling from the raw material to the cast pig is by conveyors and gravity. Ore from nearby mines is crushed and put into storage bins. A dryer is being put in because of the difficulties of grinding and handling wet ore. Limestone and coal (for other than blackband ores) are also stored in bins which feed from the collector head through a 3-in. pipe to a rotating distributor set in the furnace roof.

Hearth Is Electrically Heated

The furnace is of the shaft type with an electrically heated hearth served by three 500-kw single phase transformers. The furnace is 37 ft high with a 7-ft ID. The hearth

will hold about 5 tons of metal and a ton of slag. Power is supplied by three 8-in. graphite electrodes coming into the furnace at a 15-degree angle. Three hot blast stoves are fired with waste gas from the top of the furnace.

Cold blast from a 2240 cfm 2-stage Spencer blower supplies the three stoves each of which discharges through two tuyeres to the lower part of the furnace. Blackband ore, being carbonaceous, needs no additional coal.

Iron Oxide Reduced

The iron oxide of the charge is reduced by carbon monoxide as it falls freely through the shaft of the furnace. Since this reaction is slightly exothermic, no heat need be supplied for it. The reduction of the silicon, however, is done by electric heat and excess carbon in the hearth of the furnace, the carbon monoxide of this reaction ascending through the shaft of the furnace and assisting in the reduction of the iron.

The iron is tapped at regular intervals to an electrically heated tilting furnace from which it is cast in a pig machine having 112 molds for 100-lb pigs.

Blackband iron ore varies in iron content from 22 to 30 pct and contains from about 10 to 25 pct SiO₂. From 1½ to 2½ ft of coal is usually found with the ore, which

varies in thickness from 3 to 7 ft with an overburden of from 20 to 50 ft. Much of this ore can be mined by stripping, although underground mining is feasible where the overburden is excessive for stripping.

Defiance Machinery Sold

Toledo—H. D. Bennett, president of Defiance Machine Works, Defiance, Ohio, said that the machinery and equipment of Defiance has been sold through A. E. Reuben Co. to an undisclosed purchaser who has made arrangements with Industrial Plants Corp., Chicago, to dispose of the machinery and equipment at a public auction Sept. 20 to 21. Mr. Bennett said the land and buildings of the company, comprising 175,000 sq ft are available for sale or lease.

Welding Assn. Holds Meeting

Philadelphia—An Eastern Zone meeting of the National Welding Supply Assn., consisting of distributors and manufacturers of welding supplies and equipment, will be held at Hotel New Yorker, New York, Sept. 29. The following states are included in the Eastern Zone: Connecticut, Massachusetts, Maine, Vermont, New Hampshire, New Jersey, New York, Pennsylvania and Rhode Island.

Tin Restrictions Lifted Permitting Imports

New ruling permits private import of all grades of pig tin . . . Some controls will be exercised by Commerce Dept.

Washington — Restrictions on the uses of tin have been wiped out by the Dept. of Commerce. The action was taken by revising conservation order M-43, effective Aug. 26, and revoking conservation order M-81, effective Dec. 1.

The changes also provide for the relatively free importation of tin by private business. Although end-use restrictions are eliminated, the

general framework of the order remains in effect and the following controls will continue to be exercised by the Commerce Dept.

- (1) Allocation of all pig tin.
- (2) Inventory controls on pig tin and all materials containing tin.
- (3) Reports by holders, distributors, importers, and users of tin.
- (4) Import controls on pig tin and materials containing tin.

Controls over tin imports by private firms will be maintained under the authorization procedure established earlier in the year to regulate imports of off-grade metal and now expanded to permit relatively free private import of all grades of pig tin.

All pig tin containing less than 99.65 pct of tin, including stocks of these grades held by the Reconstruction Finance Corp. and all private imports of pig tin of any tin content, will be allocated to manufacturers without regard to end use or present allocation quotas.

Pig Tin Will be Allocated

RFC stocks of pig tin containing more than 99.65 pct of tin will be distributed to users according to present allocation quotas, after consideration is given to all other receipts by them of such grades. Allocations of these RFC stocks are being continued as an interim measure, pending reestablishment of private supply channels. As privately held supplies increase, allocations from RFC stocks will be curtailed, and discontinued on a date to be announced.

This action is in keeping with the department's announced intention to decontrol tin as quickly as supplies appeared adequate to meet the needs of all industry and of the strategic stockpile.

Latest estimates of world production and consumption, reached

at the recent conference of the International Tin Study Group in London, are as follows: Production for 1949, 170,000 tons; for 1950, 190,000 tons; for 1951, 205,000 tons. Estimated consumption figures are 138,000 tons in 1949; 158,000 tons in 1950; and 162,000 tons in 1951.

The United States consumes approximately one half of the world's production of tin. Half of what the U. S. consumes is used in the manufacture of cans—themselves about 99 pct steel despite the common usage of the name "tin can."

All tin imported into the U. S. was through the RFC, also the owner of the country's only tin smelter in Texas. The tin was resold to private companies at the approximate purchase price. The price of Grade A tin is now \$1.03 per lb which is the price that has been in effect for more than a year now.

Tin Use May Not Increase

Pittsburgh—Tinplate producers believe the lifting of end-use restrictions on tin will result in

New Rail Rates

New York — With Congressional conferees refusing to even consider the bill to legalize freight absorption until late September it is clear that freight rates will be important to the steel user for at least another month. If the bill later becomes law—and this is less certain today than it was a month ago—they will become a problem for the steel producer. The page at the right lists new railroad carload freight rates effective Sept. 1.

little, if any, increase in the overall use of the metal in this country.

It was pointed out that supplies of the metal have been adequate, and that the government's action had been expected.

Producers expect to have their own sources of supply reestablished within several months. Meanwhile, they will continue to draw from the RFC stockpile.

NOT THE NIGHT AFTER: Don't be deceived by what you see. It isn't the famed Indian rope trick, but a machine variation. The chain links are welded together inside and the slight wave in the chain was added to further puzzle passers-by.



Cold Metal Royalties Released

Cleveland — Another chapter in the long court fight over patents of Cold Metal Process Co., Youngstown, Ohio, ended here last week when court-impounded funds totaling \$4,016,430 were released to the trustee for the Leon A. Beeghly Fund, which has the Cold Metal patents. The money, paid by some 25 steel companies for use of the patents since about 1943, was impounded pending a determination of the government's claim that no royalty should have been paid on war contracts.

Attorneys for the Fund and the

government have agreed that \$4,016,430 of the accumulated royalties came from private business. Approximately \$3,500,000 is still impounded. Trial of the action will determine to whom it belongs.

New Diesel Assn. Director

Chicago — Robert S. Ogg is now the educational director of the Diesel Engine Manufacturers Assn. Mr. Ogg joins the DEMA staff from the Lima-Hamilton Corp., Hamilton, Ohio, where he has been employed for a number of years.

Votes on Unified Screw Thread

New York — A favorable start toward unification of the various national standards on screw threads was made by the International Standardization Organization at its recent 3-day meeting in Paris, according to The American Society of Mechanical Engineers. Delegates from 15 of the 17 countries represented voted to recommend the recently established Unified Anglo-American Screw Thread to their national standardizing bodies as the common profile for the metric and inch systems of screw threads.

Rail Freight Rates

Carload rates for iron and steel articles to major consuming points in Eastern Territory.

Effective Sept. 1, 1949. Rates are in cents per lb and do not include 3 pct Federal tax.

Consuming Points	Pittsburgh	Weirton	Chicago	Gary	Cleveland	Youngstown	Lorain	Canton	Granite City	Buffalo	Sparrows Pt.	Bethlehem	Johnstown	Coatesville
CONN.—Bridgeport	68	88	87	87	75	72	75	72	59	61	48	40	62	42
Hartford	70	70	87	87	72	72	72	75	94	61	53	43	67	46
New Britain	70	70	87	87	72	72	72	75	92	61	53	43	63	46
ILL.—Chicago	63	63			53	58	53	54	42	67	79	91	68	81
Moline	75	75	33	33	67	70	67	67	34	76	87	88	77	87
Peoria	70	70	32	32	62	67	62	62	32	75	85	88	75	86
Rockford	70	70	23	23	61	67	61	62	42	72	85	88	75	95
Springfield	70	70	34	34	63	68	63	63	29	75	84	88	75	88
IND.—Anderson	53	53	37	34	44	52	44	43	28	62	75	77	61	76
Evansville	68	68	44	44	62	68	62	63	37	75	81	85	75	84
Fort Wayne	52	52	36	32	40	44	40	42	53	57	75	76	58	75
Gary	63	63			53	58	53	54	42	67	79	81	68	81
Indianapolis	57	57	40	34	51	53	51	51	42	63	76	78	62	77
Muncie	52	52	40	34	43	51	43	44	51	61	75	76	58	75
New Castle	53	53	40	34	44	51	44	44	51	61	75	76	58	76
South Bend	57	57	28	24	46	52	46	48	53	61	77	78	63	77
MD.—Baltimore	52	52	79	79	62	57	62	61	86	58	7	38	46	28
MASS.—Boston	76	76	89	89	76	76	76	77	97	63	62	53	72	57
Springfield	72	72	86	86	72	70	72	75	92	58	54	45	67	51
Worcester	75	75	87	87	75	75	75	76	94	62	58	51	70	53
MICH.—Detroit	51	51	48	48	37	43	37	40	63	44	72	72	57	75
Flint	53	53	44	44	42	48	42	44	67	46	76	72	61	75
Grand Rapids	58	58	40	40	48	53	48	51	61	57	78	78	67	78
Lansing	54	54	42	42	43	48	43	44	62	52	76	76	61	76
N. J.—Newark	62	62	86	86	70	67	70	70	91	58	42	25	54	34
Trenton	57	57	84	84	68	62	68	67	89	58	34	22	51	20
N. Y.—Albany	63	63	81	81	63	63	63	68	89	51	53	42	58	46
Buffalo	44	44	67	67	40	40	40	43	77		58	54	44	57
New York City	62	62	86	86	70	67	70	70	91	58	42	29	54	34
Rochester	51	51	72	72	44	44	44	51	79	23	54	51	51	53
Syracuse	57	57	76	76	53	52	53	57	85	36	54	44	52	51
Utica	61	61	77	77	57	57	57	61	86	42	57	44	54	52
OHIO—Akron	33	29	54	54	14	19	18	12	68	43	61	63	42	62
Canton	32	23	54	54	20	19	24		68	43	61	62	40	61
Cincinnati	51	51	48	48	44	51	44	44	53	61	70	75	57	72
Cleveland	34	33	53	53		23	12	20	68	40	62	63	42	62
Columbus	40	40	51	51	34	40	34	33	61	52	63	68	48	67
Dayton	46	46	44	44	40	44	40	40	54	57	68	72	53	72
Mansfield	40	34	51	51	25	33	25	23	63	46	67	68	44	67
Toledo	44	44	44	44	33	40	33	34	62	51	68	72	52	70
Youngstown	22	25	58	58	23		23	20	72	40	57	61	36	57
PA.—Erie	36	37	62	62	29	28	29	34	75	28	61	58	42	61
Lancaster	51	51	79	79	61	54	61	58	86	54	25	25	42	14
New Castle	18	23	61	61	28	12	28	25	72	40	54	58	34	54
Philadelphia	54	54	84	84	67	67	67	63	88	58	29	20	48	15
Pittsburgh		15	63	63	34	22	34	32	75	44	52	54	25	52
Reading	52	52	79	79	62	57	62	61	87	54	33	15	43	15
Sharon	23	28	61	61	25	9	25	24	72	37	57	58	36	57
York	48	48	78	78	61	53	61	57	86	53	20	32	42	20
WIS.—Milwaukee	68	68	23	23	58	63	58	61	48	67	84	84	72	84

The Iron Age

Nathan Hits Steel Capacity Expansion

Union closes case with company-by-company rebuttal as fact-finding hearings stretch out beyond schedule . . . Board offers to act as mediator.

—By GEORGE F. SULLIVAN

New York — Speaking for the United Steelworkers of America, Robert R. Nathan reversed the union's stand in favor of steel expansion here last week as the Presidential fact-finding hearings drew toward a close. They had stretched out beyond their original schedule and amassed a stenographic record some 4000 pages long.

After the USWA research director, Otis Brubaker completed a financial analysis of the industry, company by company, Philip Murray wound up the union's presentation with a short sharp attack on Enders Voorhees, chairman of U. S. Steel's finance committee. Mr. Murray spoke, he said, because Mr. Voorhees had personally attacked him and had also "laid bare . . . the reactionary desires

. . . of that handful of wilful men . . . who control the steel industry of this country."

Just before the hearings ended at 7 p.m. on Monday of this week the board disclosed that it had offered to act as mediator in the dispute. The understanding was that if the offer were not accepted its recommendations would be made by Sept. 10 at the latest.

Throw Figures at Each Other

As the hearings drew to a close with rebuttal and surrebuttal the crowd in the courtroom thinned out. Both sides had done quite a job on each others figures and charges of inappropriate selection of base figures filled the air. To this was added a maze of statistics —any group of which apparently

could be used to prove the opposite side of the same argument. Or so it seemed to the casual observer.

The steel companies got a lot of things on the record and into the newspapers which they could have done in no other way. The hearings were expensive but they either delayed or stopped a strike. Incidentally they stimulated steel buying as a strike hedge and even after this wore off steel order volume held up. The time element playing into the hands of the industry just before the strike deadline has reversed itself. But regardless of the outcome the public knows a little more about steel than it did a month ago.

Industry observers were surprised at the number of smaller steel companies that appeared before the panel. These companies reasoned, however, that they were never likely to have a better opportunity to vent their views on the industrywide pattern that prevails in steel. The union rebuttal took up each company statement in detail.

Wherever steel spokesmen touched on cost they questioned the union's 30¢ per hr estimate. While many said 30¢ was either too much or would ruin them, few agreed that what the union asked would cost only 30¢. Most figured that the USWA demands would cost at least twice that. To this

Turn to Page 106

COSMIC RAY MAKER: Part of the 300 million v betatron being built for the University of Illinois in this 275 ton magnet core. This part of the first cosmic ray generator contains 70,000 silicon sheet laminations, 0.014 in. thick. Constructed and designed by Allis-Chalmers engineers to Dr. Kerst's specifications, this jumbo sized version of betatron used for industrial X-ray work will permit scientists to study cosmic ray phenomena.



Demand for Silvery Iron Up

Keokuk, Ia.—Demand for silvery iron and ferrosilicon has strengthened. With the pickup in steel operating rates and higher foundry operation in the Midwest, Keokuk Electro-Metals here has stepped up production.

Officials of the company told THE IRON AGE there is some question as to whether they will experience continued good business after September, the reason being that if there is no strike they will then be able to determine how much of the recent buying was a hedge against strike possibilities.

Agreement Reached on Load Limitations for Steel Carriers

Motor vehicles for iron and steel transport to show maximum payload

Washington—Motor carriers of steel and major steel companies have reached an agreement with the Interstate Commerce Commission on load limitations and on means of securing lading on trucks. The agreement covers carriers in the area east of Mississippi and north of the Ohio and Potomac Rivers.

Representatives of the major steel companies have stated that their companies will refuse to load trucks beyond the agreed limits and the ICC expressed the belief that all members of the American Iron & Steel Institute will follow a similar policy.

The maximum pay load capacity of each motor vehicle to be used for transportation of iron and steel in the territory will be painted on the vehicle. This marking will represent the greatest load which may be safely transported by the vehicle. The maximum capacity is determined by a formula based on the size of tires used, not exceeding the maximum tire sizes recommended by the manufacturer of the vehicle.

Payload Markings Required

All vehicles intended for transportation of iron and steel in the territory must be so marked before Nov. 1, 1949, or they will not be loaded by the major steel companies after that date. All such vehicles must also be equipped with bulkheads or their equivalent and with means for fastening lading on or before Jan. 1, 1950. Representatives of the motor carriers agreed that vehicles which are not so equipped will not be used for transporting iron and steel after that date.

Metal Show May Draw 50,000

Cleveland—As many as 50,000 engineers and technical men in the metalworking field are expected to attend the National Metal Congress and Exposition in

the Public Auditorium here Oct. 17-21. The show management points out that the affair not only has a theme but an important objective toward which the theme is directed.

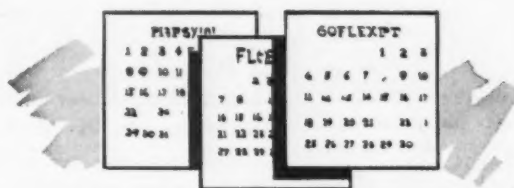
"Economy in Production," the theme, is expected to attract to Cleveland many of the country's leading technicians and their staffs.

Logan Diversifies Its Products

Chicago — Logan Engineering Co. has bought up the patent rights for the manufacture of automatic door checks. Logan, a builder of lathes, has found it necessary to diversify products due to the ups and downs of the machine tool business.

Scrap Institute Sponsors Seminar at Northwestern U.

Philadelphia — The first scrap industry seminar to be held under the auspices of the Institute of Scrap Iron and Steel at Northwestern University began this week. Lectures on a wide variety of subjects relating to the industry are being delivered in the week-long intensive course by members of the institute and some outside authorities. The enrollment for the course is 241 all of whom are the candidates of the active members of the Institute. Aug. 30 was devoted to an inspection tour of the Gary Works of Carnegie-Illinois Steel Corp., and of the dealers' yards in South Chicago.



Dates to Remember

- Sept. 12-16 Instrument Society of America, conference and exhibit, St. Louis.
- Sept. 14-16 Porcelain Enamel Institute, annual forum, Columbus, Ohio.
- Sept. 18-23 American Chemical Society, national meeting, Atlantic City, N. J.
- Sept. 25-28 American Mining Congress, metal mining convention, Spokane.
- Sept. 25- American Institute of Mining & Metallurgical Engineers, midyear meeting, Columbus, Ohio.
- Oct. 1- National Electronics Conference, Chicago.
- Sept. 26-28 American Society of Mechanical Engineers, fall meeting, Erie, Pa.
- Oct. 3- 4 Steel Founders Society of America, fall meeting, White Sulphur Springs, W. Va.
- Oct. 3- 5 American Coke & Coal Chemicals Institute, annual meeting, Skytop, Pa.
- Oct. 3- 6 Assn. of Iron & Steel Engineers, annual convention, Pittsburgh.
- Oct. 4- 6 Industrial Packaging & Materials Handling Exposition, annual convention, Detroit.
- Oct. 10-14 American Society for Testing Materials, West Coast meeting, San Francisco.
- Oct. 12-15 Electrochemical Society, semiannual meeting, Chicago.
- Oct. 13-15 Foundry Equipment Manufacturers Assn., annual meeting, White Sulphur Springs, W. Va.
- Oct. 17-21 National Metal Congress, Cleveland.
- Oct. 24-26 American Gear Manufacturers Assn., annual meeting, Chicago.
- Oct. 27-28 Gray Iron Founders Society, annual meeting, Chicago.
- Oct. 27-28 Porcelain Enamel Institute, annual meeting, French Lick, Ind.
- Oct. 30- National Tool & Die Manufacturers Assn., annual meeting, New York.
- Nov. 2

Viewing the News from

The ECONOMIC SIDE

by JOSEPH STAGG LAWRENCE

"Labor criteria"

THE essence of the labor case presented to the presidential fact-finding board is that the steel industry is making some money. Ergo it can afford to pay pensions and higher wages. Nathan, the hired specialist of the CIO, anticipating industry arguments that the operating rate might decline, "demonstrated" a projected and strictly hypothetical break-even point at 30 pct of capacity. The purpose, of course, was to show that the industry could afford higher wage costs even though operations declined substantially.

When industry spokesmen rejected this contention it was a member of the fact-finding panel, Judge Rosenman, who asked what "criteria" the steel companies used in determining proper wage standards.

While this question was answered emphatically by steel witnesses, it cannot be said that it was answered conclusively. Or that it made any impression on the judge who sparked the thinking and provided the language for some of the most characteristic expedients of the New Deal.

This was not the fault of the steel people. The theories of labor value evolved by orthodox economists are neither clear nor convincing. That competition determines wage levels is a proposition which does not lend itself readily to exposition. What competition? The labor market?

The word "market" implies a meeting place of willing sellers free to offer their services and willing buyers equally free to bid for those services. In an economy dominated by industry-wide unions where workers cannot get jobs without a union card, where professional labor leaders are the high lords of monopoly, a free market for labor does not exist.

Labor standards during the last 15 years in this country have evolved out of an uneven struggle between employers on the one hand bargaining individually and labor bosses on the other hand with statutory, administrative and judicial cards stacked in their favor. The monopoly power denied to industry is freely exercised by professional unionneers additionally anointed with the holy oil of political favor.

Under these circumstances the question by Judge Rosenman regarding labor "criteria" was ingenuous. Labor "criteria" are a resultant of monopoly power, labor ruthlessness, and the willingness of government to see costs and prices rise. The fact-finding board itself was a palpable political artifice to bring about a rise in labor costs which could not plausibly be effected at a time when commodity prices were declining and corporate earning power had passed its peak.

On the positive side the steel employer can point to the level of wages in the steel industry and show that they compare favorably with the best rates in the country. The wages of the steel employee—when he works—translated into food, clothing, and shelter are higher than they have been at any comparable period in the past. In the absence of compulsory purchases by consumers of steel, a stage of economic planning not yet reached in this country, the buyers and users of steel retain the right to refuse a product which costs too much. Such refusal is in fact a revolt against high prices and when excessive wage costs are the cause the worker has priced himself out of a job. In the long run the pseudo-judicial procedure of the fact-finding board as a device for raising wages may do the worker more harm than good.

Mine Disaster Prevented

Chicago — Near disaster was averted at Peabody Coal Co.'s No. 59 mine at Springfield, Ill., when a fire broke out Aug. 15 and all 257 men escaped uninjured. James Boyd, director of the Bureau of Mines, said that this was "an outstanding example of how lives can be saved by intelligent planning of mine development and rescue operations and the orderly conduct of men when disaster threatens."

Nathan Hits Steel

Continued from Page 101

Otis Brubaker replied that the union wanted 30¢, nothing more. Presumably this approach might start with the 30¢ and see what results it produced, since the industry's statisticians do not agree with the USWA insurance adviser, Murray Latimer.

Says Wage Scales Must Be Equal

To the repeated assertions of the smaller steel firms that they could not pay the same wage scales as the larger companies Mr. Brubaker pointed out that in several individual cases those smaller companies had paid the going scale even before they were unionized and would not be able to keep workers in any district where there were big plants if they didn't do so now.

Mr. Nathan amazed the steel executives present in the courtroom when he asserted that the country would be better off today if there had been "less expansion, less investment in 1947 and 1948 and more consumption."

Philip Murray closed the USWA case with a reply to the remarks of Mr. Voorhees. He asserted that U. S. Steel's finance committee chairman had given the board "a mixture of bad economic theory, reactionary social policy and vicious personal insinuation, all of it flavored with corny dialogue." Referring to pensions he concluded by saying, "The union will not rest—I will not rest—until the industry acknowledges this just debt by making a decent provision for those who have spent their lives in its service."

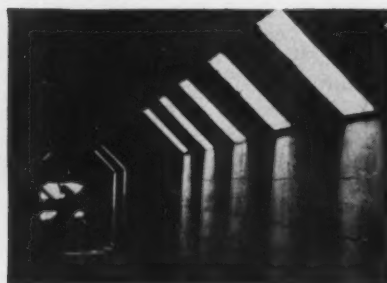
HERE'S LOW-COST PROTECTION against heat and corrosion in flues or stacks



LUMNITE* REFRACTORY CONCRETE



Inside of Open Hearth Flue. There are no ragged walls or flattened arches. Notice its excellent condition after 5 years of service.



The interior of this waste-gas coke oven flue was built with Lumnite concrete. No lining was needed on this job.



Shooting Lumnite Concrete lining in steel stack. This economical Lumnite lining in stacks protects against corrosion and heat.

Flues are fully protected against heat and corrosion when Lumnite Refractory Concrete is used. Whether used as a monolithic structure or as a lining in flues, Lumnite resists high temperatures and the attacks of condensate and sulphurous gases; withstands the abrasive action of high-velocity gases and fly ash. In stacks, smooth, jointless Lumnite linings allow no breathing, boost drafts and keep gas temperatures up.

Lumnite Refractory Concrete is easily installed. It may be placed quickly in any size, shape or thickness. Stack linings of Lumnite and corrosion-resistant aggregate are trowelled in place or "shot" by concrete gun over reinforcing mesh. Maintenance costs are low. Outage time for repairs is kept to a minimum

because Lumnite reaches service strength in 24 hours or less. Thus long service and easy maintenance give you many a *plus* in economical operation. For further information on Lumnite Refractory Concrete in flues and stacks, write to Lumnite Division, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

SPECIFY CASTABLES MADE WITH LUMNITE

Where suitable aggregates are not readily obtainable, tailor-made mixtures, ready for immediate use, are available. These factory-prepared mixtures of Lumnite and selected aggregates, when mixed with water on the job, may be cast into place for furnace door linings, arches, blast furnace pads, annealing furnace car tops and door linings. Special shapes can be cast in molds—ready within 24 hours. Castables made to meet specific temperature and insulation requirements are prepared by manufacturers of refractories and sold by their distributors.

*"LUMNITE" is the registered trade mark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.



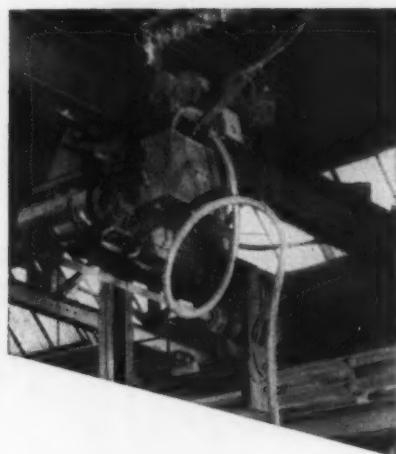
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FOR REFRACTORY CONCRETE

"THE THEATRE GUILD ON THE AIR"—Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network

September 1, 1949

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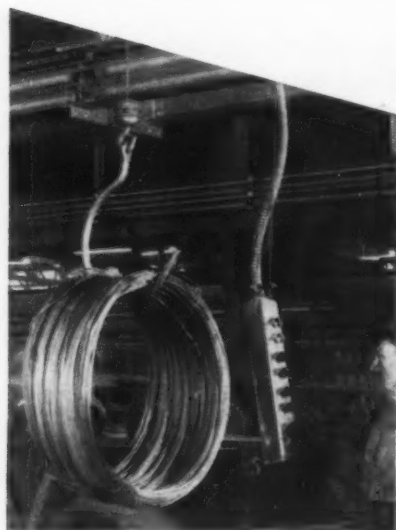


"PUSH-BUTTON WAR"

against high operating costs!

Lifting and moving wire from winding drums to the next operation was a costly proposition in this plant. Then a 1/2-ton, single I-Beam, motorized Reading Electric Crane was installed. Now the operator pushes a button—the Crane does the rest! That's real handling economy!

Better, lower-cost materials handling is never an "accident" with *Unit-Designed* Reading Cranes. Never mass produced, they are tailored to fit your job—at no extra engineering cost! Find out more about this unique method of crane construction. Call a Reading Engineer for information or installation recommendations, today.



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Chain Hoists • Electric Hoists
Overhead Traveling Cranes

READING HOISTS

Iron Age

Introduces

Continued from Page 23



FRANK J. ASCHENBRENNER, assistant director of research & engineering, Air Reduction Sales Co.



EARL C. CLARK, assistant director of research & engineering, Air Reduction Sales Co.

Frank J. Aschenbrenner and Earl C. Clark have been named assistant directors of research and engineering by AIR REDUCTION SALES CO., New York. Mr. Aschenbrenner will be in charge of the Air Reduction Murray Hill (New Jersey) laboratory. Mr. Clark has been placed in charge of the development and engineering groups. Sales personnel changes have also been made by the company. J. B. Davenport, formerly assistant sales manager at Detroit, has been appointed assistant manager of the Charlotte district. J. H. Hart, formerly assistant sales manager at Detroit, has been promoted to assistant manager of the district.

William S. Wilbraham, associated with LUKENS STEEL CO., Coatesville, Pa. since 1927, has been named coordinator of estimating for the company and its divisions, By-Products Steel Co. and Lukenweld. Glenn E. Johnston has been transferred to the Chicago district sales office of the company.

Samuel H. Paul will become director of purchases at HEINTZ MANUFACTURING CO., Philadelphia, on September 1.

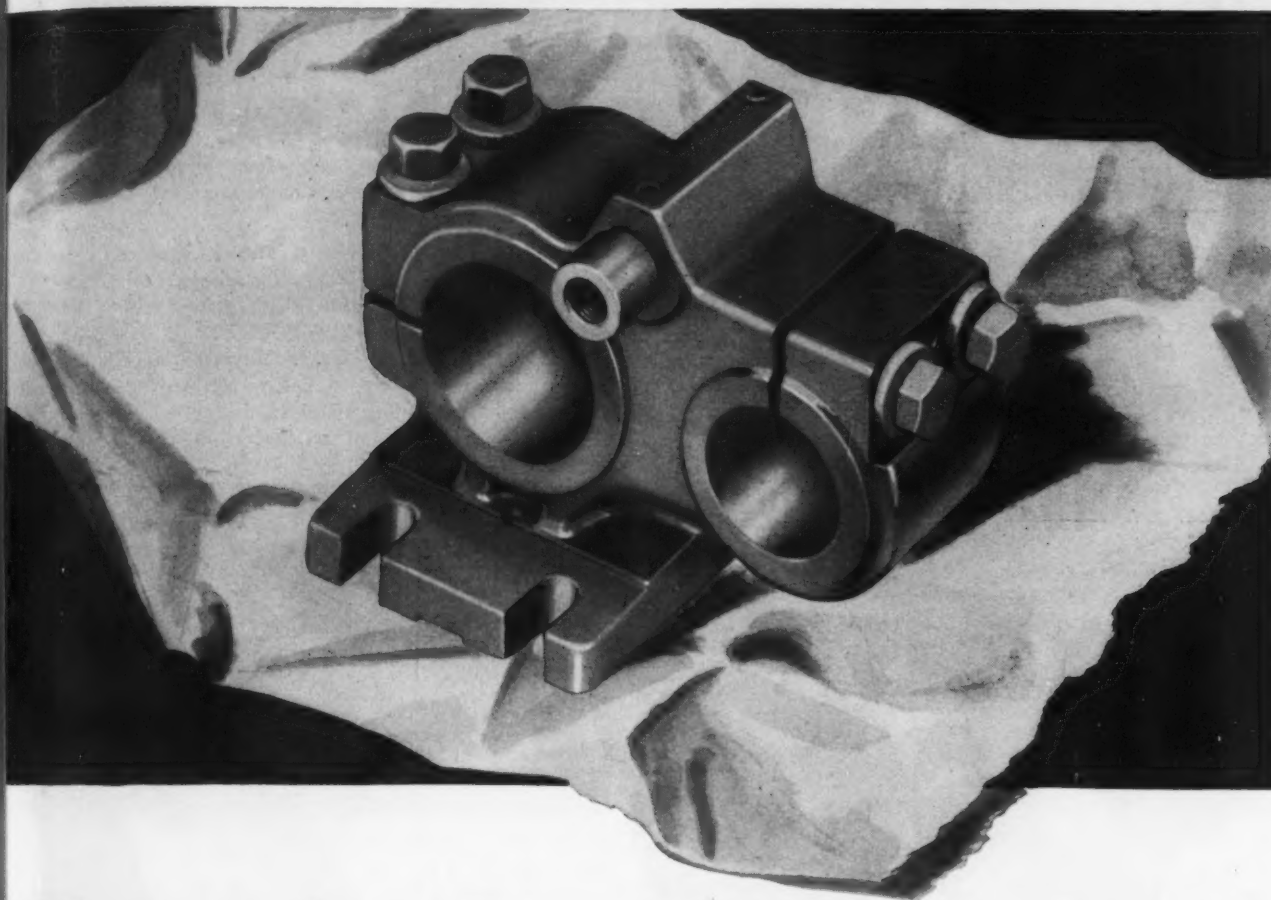
George C. McCormick has joined INDUSTRIAL HEATING EQUIPMENT CO., Detroit, as sales manager. He was formerly president of Sterling Alloys and manager of the Heat Treating Division of Loftus Engineering Corporation. Clifton E. Wenger has entered Industrial as Controlled Atmosphere engineer.

Herbert A. Spring has been appointed secretary and John F. Fahes, treasurer, LEMPCO PRODUCTS INC., Bedford, Ohio.

George Zahn, for several years sales manager of the Instrument Division of STEWART-WARNER CORP., Chicago, has become assistant to vice-president, for marketing automotive and other products of Division One of the corporation.

Angus V. McLeod has become general traffic manager of THE PERMANENTE METALS CORP., Oakland, Calif. He has been with Kaiser-operated industries since 1941.

Merrill W. Manz, who joined OHIO BRASS CO., Mansfield, Ohio in 1938, has been elected vice-president. Roger A. Black succeeds Mr. Manz as



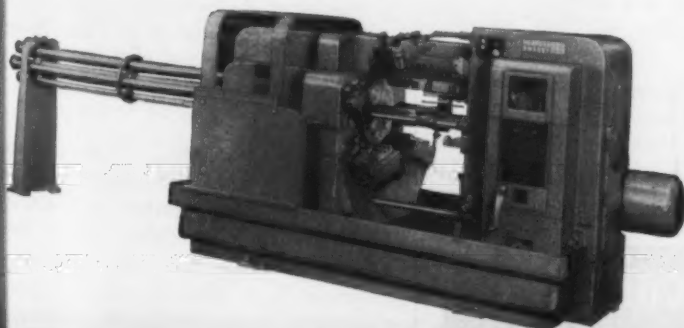
What makes this tool holder unusual?

This Tool Holder will fit *any position* on *any* Warner & Swasey 5-Spindle Automatic.

All Warner & Swasey Tool Holders are *interchangeable* from position to position and machine to machine.

This interchangeability means smaller tool inventory, quicker setups and greater flexibility.

Call your nearest Warner & Swasey Field Representative to find out how *your* costs can be cut — or write



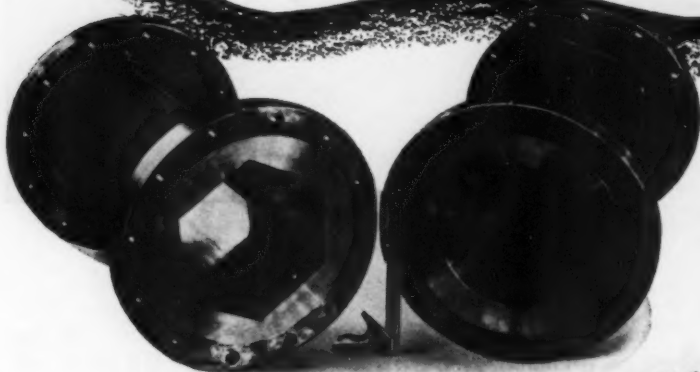
*You can machine it
Better, Faster,
for Less...with a
Warner & Swasey*

**WARNER
&
SWASEY**
Machine Tools
Cleveland

TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

DURASPUN

18-8 Centrifugal Castings



...specified "centrifugal"
because uniform, close-grained
metal was wanted

These castings are sections of a special fractionating column, cast and flanged as illustrated at the right; machined and finished at the left.

Why **centrifugal** castings, you ask?

Specifications called for an exceptionally close-grained, uniform metal structure free from blowholes of any sort on the inner face. Centrifugal castings assure this superior metal structure.

Our service to industry is two fold: centrifugal castings and static castings, produced in one of the most modern and best technically controlled foundries in the country. Why not try Duraloy for your next high alloy casting requirement?

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WASH. D. C.: 1000 N. Dearborn • WILMINGTON: 1000 N. Dearborn • WYOMING: 1000 N. Dearborn

IRON AGE INTRODUCES

Continued

factory manager. H. E. Shoemaker has been named manager of the foreign trade department.

Orrin G. Meyers has been promoted as sales manager of HUNTER SPRING CO. (formerly HUNTER PRESSED STEEL CO.), Lansdale, Pa. Mr. Meyers has lectured on spring design at engineering meetings and is author of several technical articles.



EARL J. MILLS, manager of Southwest Sales District, Diamond Alkali Co.

Earl J. Mills, formerly manager of less-carload sales for DIAMOND ALKALI CO. at its Chicago Sales Office, has become manager of the Company's Southwest Sales District. His new headquarters is at Houston, Texas. Charles W. Klaus, manager of carload sales at Chicago since 1947, has been named to take complete charge of Diamond sales activities in the Middle West, where he has been engaged in chemical sales for nearly four decades.

Benjamin S. Sampson is the new manager of the Industrial Furnace & Oven Division of CLAUD S. GORDON CO., Chicago.

John A. DeGroot, formerly at Pittsburgh, has been transferred to the Pacific Coast District of WESTINGHOUSE ELECTRIC CORP. as assistant manager. Mr. DeGroot succeeds W. J. Howell, who has been appointed assistant to the corporation's apparatus sales manager at Pittsburgh.

Turn to Page 152

How Allis-Chalmers Induction Heaters INCREASE OUTPUT ON 4 DIFFERENT JOBS



1 SOLDERING . . . production tripled! An Allis-Chalmers Induction Heater is used by a pressure gage manufacturer for the soft soldering of tempered parts of dissimilar material. The seal must be air-tight and the temper unaffected. Not only are these requirements met, but output is three times greater.



2 BRAZING . . . eight fittings in less than a minute! Brazing fittings into compressor housings is the application of this refrigerator manufacturer. Four housings, each with two fittings are simultaneously brazed in less than 50 seconds — joints are pressure tight and scale is held to a minimum.



3 ANNEALING . . . 2400 brake arms every hour! Automobile brake arms are annealed in this fixture prior to being formed. The set-up is completely automatic, an operator merely loads the handling equipment. The 20 kw Allis-Chalmers Induction Heater anneals 40 of these brake arms per minute.



4 HARDENING . . . one shaft per minute! An automotive manufacturer had the problem of hardening eight localized areas of a rocker arm shaft to Rockwell 55 C or better. A 20 kw Allis-Chalmers Induction Heater is doing the job at the rate of one shaft per minute with no objectionable scale or warpage.

EASY TO OPERATE, simple, versatile, Allis-Chalmers Induction Heaters are being used for soldering, brazing, hardening and heating for forging and annealing. Yes, all of these operations can be handled on the same heater by merely changing work coils. Uniformity, selectivity, quick, controlled heating and high production are advantages for you. 1, 2, 10, 20, 50, 75, 100 and 200 kw are standard ratings. Check with your nearby Allis-Chalmers Sales Office, or mail coupon.



ALLIS-CHALMERS, 1019A SO. 70 ST.
MILWAUKEE, WIS.

A 2

Please send information about Induction Heaters.

Name.....

Title.....

Company.....

Address.....

City..... State.....

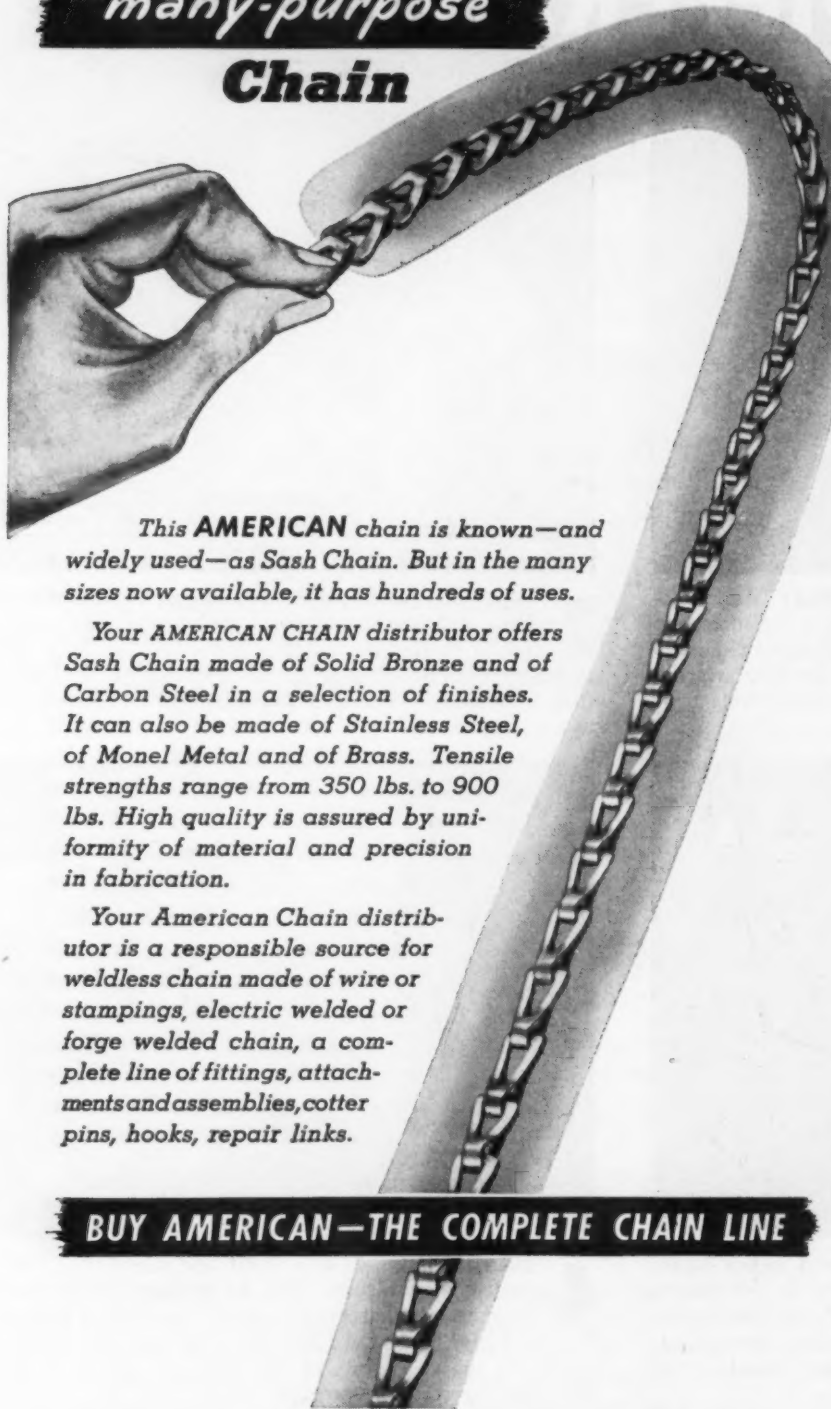
ALLIS-CHALMERS

AMERICAN SASH CHAIN

...the

"many-purpose"

Chain



This **AMERICAN** chain is known—and widely used—as Sash Chain. But in the many sizes now available, it has hundreds of uses.

Your **AMERICAN CHAIN** distributor offers Sash Chain made of Solid Bronze and of Carbon Steel in a selection of finishes. It can also be made of Stainless Steel, of Monel Metal and of Brass. Tensile strengths range from 350 lbs. to 900 lbs. High quality is assured by uniformity of material and precision in fabrication.

Your American Chain distributor is a responsible source for weldless chain made of wire or stampings, electric welded or forge welded chain, a complete line of fittings, attachments and assemblies, cotter pins, hooks, repair links.

BUY AMERICAN—THE COMPLETE CHAIN LINE

ACCO

York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.



**AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE**

In Business for Your Safety

FREE

PUBLICATIONS

Continued from Page 34

in 8-p. bulletin. Alloy has greater corrosion resistance than 18-8, yet retains approximately the same working characteristics. *Duriron Co., Inc.* For more information, check No. 10 on the postcard on p. 35.

Industrial Chemicals

Book lists chemicals available for various industrial and pharmaceutical uses. Also contains chemical data, tables, factors, reference data and handling and storage information. *General Chemical Div., Allied Chemical & Dye Corp.* For more information, check No. 11 on the postcard on p. 35.

Refractory Materials

Chrome magnesite castable refractory for monolithic hearths and bottoms is featured in bulletin No. HC-103T. Refractory used for drop forge furnaces, boiler furnaces, soaking pits and other applications. *Quigley Co.* For more information, check No. 12 on the postcard on p. 35.

Sheet Metal Machinery

Various folders brakes, bead-ers, crimpers, groovers, slip roll formers, shears, hand tools and presses for sheet metal forming are featured in 16-p. folder. *Niagara Machine & Tool Works.* For more information, check No. 13 on the postcard on p. 35.

Industrial Ventilator

Roof ventilator which exhausts large volume of polluted air from industrial buildings is described in bulletin giving examples, specific design data and suggestions for installation of such equipment. *Powermatic Ventilator Co.* For more information, check No. 14 on the postcard on p. 35.

Resume Your Reading on Page 35

11 proven safeguards for industry's never-ending fight against **RUST**

After painstaking evaluation of its long line of rust preventives, Houghton now announces a revised line-up of eleven products which will meet practically all your needs for prevention of rust either indoors or out.

These eleven are not all new. They need not be, for we've been helping industry fight rust for some eighty years, and have developed a wide variety of compounds that have served metal men long and well.

Note the line-up at the right: five solvent types, four removable and one non-removable . . . five oil and grease types, ranging from an SAE 10 fluidity to a heavy grease. Also a concentrated base

for dilution with oil or solvent in the user's plant, for economical indoor protection.

For detailed description and recommendations for your corrosion problem we invite you to use the handy coupon below.

<u>Product</u>	<u>Type of film</u>
Rust Veto 344	Solvent type, dry film, removable
Rust Veto 110-D	Solvent type, dry film, non-removable
Rust Veto A-2	Solvent type, dry film, waxy type
Rust Veto 369	Solvent type, light oil
Rust Veto 266	Fingerprint neutralizer
Rust Veto Light	Light oil type (SAE 10)
Rust Veto Medium	Medium oil type
Rust Veto Medium Heavy	Heavy oil type
Rust Veto Heavy	Soft grease type
Rust Veto Extra Heavy	Solid grease type
Rust Veto Concentrate	Light oily film (when diluted)

Fill out and mail this coupon to receive new illustrated booklet on Houghton's All-Star Line-up of RUST VETO compounds that prevent rust.

E. F. HOUGHTON & CO.

303 W. Lehigh Ave., Phila. 33, Pa.

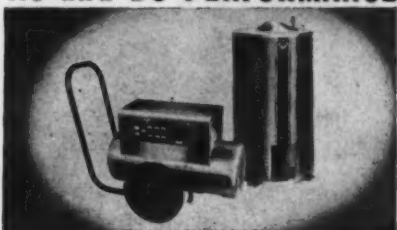
Send me the new Rust Preventive booklet.

NAME _____

COMPANY _____

CITY _____ STATE _____

NEW ARC WELDERS BOOST AC and DC PERFORMANCE



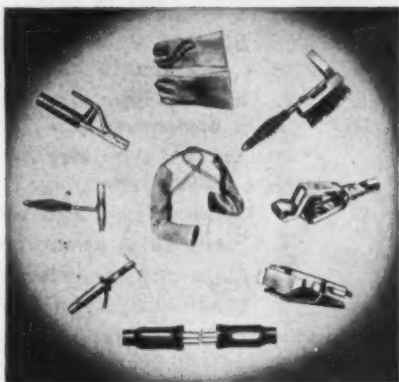
FASTER welding, better quality welds, lower power costs, and simplified maintenance are furnished by a new line of AC and DC arc welders introduced by Metal and Thermit Corporation.

Built-in capacitors for high power factor, wide current range for full rated output, and, fingertip, stepless current control for precise current setting are featured in the AC units. Available in 150 to 500 amp. models for manual arc welding, additional models for inert arc and automatic welding.

Full capacity, rugged duty DC arc welders are compact, light in weight—half the size and half the weight of older types—and are equipped with simplified current control, automatic electrode selector. Furnished in 150 to 400 amp. sets—motor driven, engine driven or belt drive.

Descriptive folder gives full particulars. Address Metal and Thermit Corporation, 120 Broadway, New York 5, N. Y.

ACCESSORY DIVIDENDS DECLARED



UNDERSCORING the importance of proper accessories to top welding performance, more and more fabricators are taking pains with selection of accessories. Speedier, lower cost, safer and improved welding are assured when such items as helmets, shields, holders, connectors, cleaning tools and protective clothing are carefully selected. And more and more fabricators—sold on M & T electrode and arc welder performance—are specifying the M & T line of "accessories to the perfect weld." For descriptive literature, address Metal and Thermit Corporation, 120 Broadway, New York 5, N. Y.

NEW

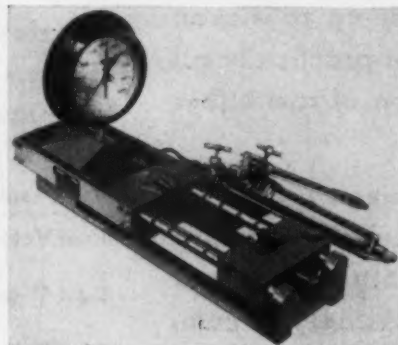
PRODUCTION IDEAS

Continued

of 0.3, 0.6 and 1.5 mg of KOH per gram of oil. The test is made with 1/3 oz of oil sample and takes about 2 min. The kit consists of four glass cylinders, two pints of a neutral solution of water-alcohol-pink indicator, 20 ampoules of the KOH, and files for opening the ampoules. *Gerin Corp. For more information, check No. 27 on the postcard on p. 35.*

Tensile Tester

Model PO-40 portable tensile testing machine is particularly adapted for testing pipe welds and other types of welds where on-the-



job testing is preferable. With a 40,000 lb capacity, the machine will make tests on specimens from 6 to 13 in. long, up to 3/8 in. thick and 2 1/4 in. wide. Its operation is hydraulic, by means of a hand pump integral with the base. The machine is adjustable and weighs slightly over 200 lb. The unit is complete with pump, easy-to-read dial gage, and one set of flat jaws. *Steel City Testing Machine, Inc. For more information, check No. 28 on the postcard on p. 35.*

Small Punch Press

Punching, shearing, staking, riveting, forming and coining are possible on the new Midget punch press. The press has a standard stroke of 3/4 in. maximum with a

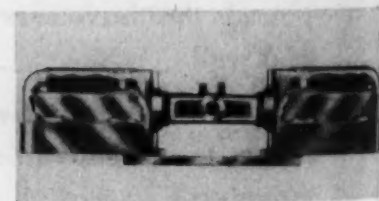
3/4 in. hole in the ram. Approximate speed with a 1725 rpm motor is 290 strokes per min. A 1/4 hp motor is recommended. The alloy steel 3/4 in. OD crankshaft is equipped with a sliding key type



clutch and a 20 lb flywheel measuring 9 in. diam. Overall bolster plate dimensions are 4 x 6 x 5/8 in. with a 1 3/4 in. hole in center. *Benchmaster Mfg. Co. For more information, check No. 29 on the postcard on p. 35.*

Solenoid Valves

A new line of double solenoid valves for air pressures of 0 to 125 psi are available in 1/4, 3/8, 1/2 and 3/4 in. sizes. The valve has a one-piece bronze base for each solenoid, heavy, powerful solenoids for positive seating and cool operation, and heavy sheet metal core for protection. Models are available in 2



way, 3-way piped exhaust, and 4-way piped exhaust, for 110, 220 and 440 v in both 50-60 cycle and 25 cycle current. *Valvair Corp. For more information, check No. 30 on the postcard on p. 35.*

Multi-Purpose Lifter

For handling bulky and awkward materials and equipment, a rugged multi-purpose, non-slipping Gonser Grizzly lifter has been designed to provide easy, foolproof, trouble-free operation. A lifter bar, call-

Now is the Time

to convert your present equipment
to
BURDETT (RADIANT HEAT) GAS SYSTEMS

Lower Unit Costs —
Higher Quality Standards in
Paint-Enamel-Lacquer Drying
Flash Coat Drying
Burn-off, Degreasing Process
Water Dry-off
Core Baking
Soft Metal Melting
Food Processing

INCREASED OUTPUT — Processing time reduced because heat is transferred faster —by radiant energy.

LOWER FUEL COST—Scientifically different burner permits complete combustion.

BETTER QUALITY CONTROL — Radiant Heat assures constant, uniform heat distribution . . . the proper bake for any object regardless of shape.

These benefits will help you take the lead in your competitive market. Your present facilities can be readily adapted for conversion to a Burdett Radiant Heat Gas System individually engineered to your requirements. Or, if you contemplate a new installation, plan now to include these advantages. Send production data to Burdett Technical Service Department for recommendations, or request descriptive booklet.



WHAT USERS SAY . . .

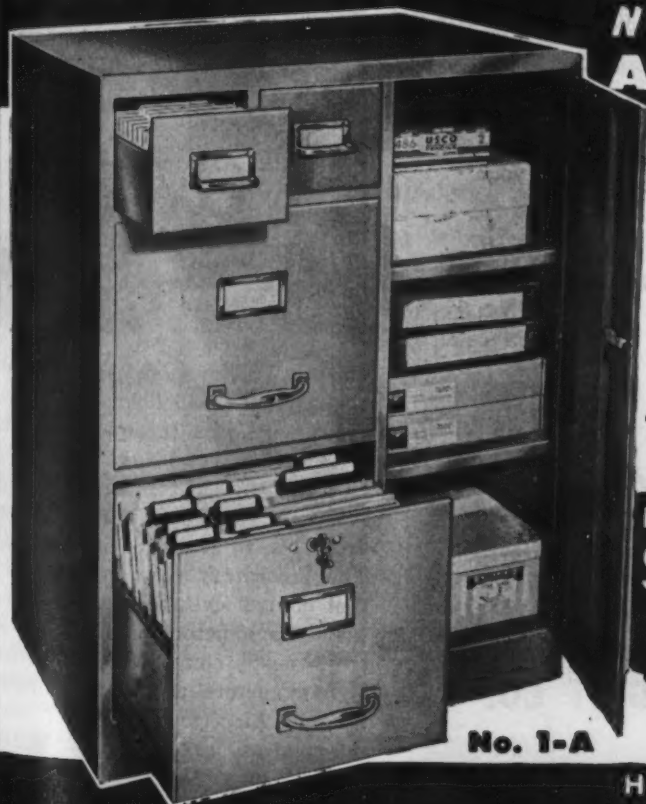
"This installation has made it possible for us to increase production about 40% with no increase in net labor cost," writes Logan Company, Louisville metal furniture manufacturer, of their Burdett Radiant Heat Gas System. "We estimate a 30% savings on gas . . . the Burdett System provides equal distribution of heat to all parts of the oven which makes it possible to bake any object with the assurance that it will be properly baked regardless of shape."

THE BURDETT
BURNER
Heart of the
Burdett System

BURDETT
MANUFACTURING COMPANY
1437 W. MADISON STREET CHICAGO 24, ILLINOIS

RADIANT HEAT GAS SYSTEMS

Steelmaster



No. 1-A

The Right Answer!!

NEW! NEW! NEW!
ALL-IN-ONE SPACE SAVER
COMPACT STEEL FILING SYSTEM

The complete filing system **All-In-One Unit**— records, cards, correspondence, letters and storage unit—keeping all records at finger-tip control with business efficiency.

Space stretcher—space saver. Ideal for 101 uses. Precision made—best furniture steel and finished in Futura Grey lustre-lite to lighten and brighten office work. Outside dimensions: 33" h. x 27" w. x 16" d.

Wt. 90 lbs.

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**\$39⁹⁵
ONLY**

- OFFICE
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- ROOMS

- HOME
- DENS
- SCHOOLS
- CHURCHES
- GARAGES
- SOLICITORS
- ETC.



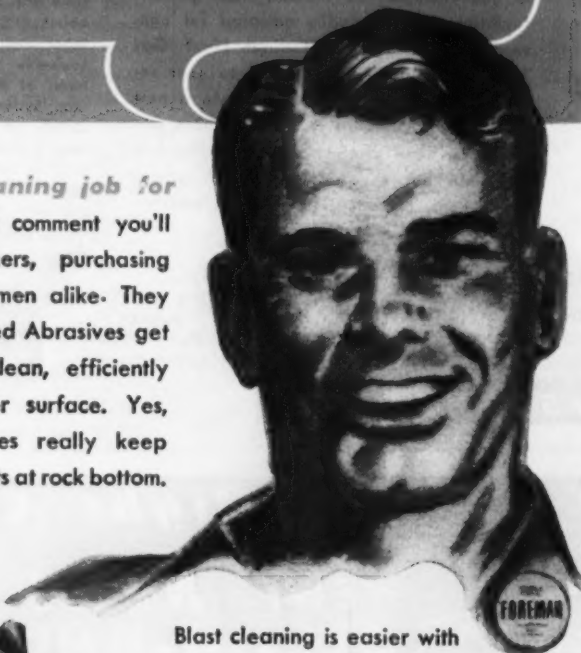
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Prices F.O.B. Brooklyn, N. Y.

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A better cleaning job for us... that's the comment you'll hear from owners, purchasing agents and foremen alike. They all agree, Certified Abrasives get castings really clean, efficiently produce a better surface. Yes, Certified Abrasives really keep blast cleaning costs at rock bottom.



Blast cleaning is easier with Certified. Both Samson Shot and Angular Grit can be used over and over again. With them on your job you get **more work done ...every day**. Order Certified today for better cleaning!

Always specify "Certified"

ACCEPTED AND USED FOR OVER 55 YEARS.

**PITTSBURGH
CRUSHED STEEL CO.**
PITTSBURGH, PA.

**STEEL SHOT
AND GRIT CO.**
BOSTON, MASS.

NEW

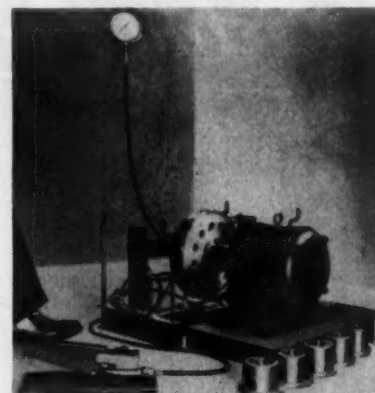
PRODUCTION IDEAS

Continued

brated in inches, is available in various lengths. Readable calibrations assure accurate, balanced lifting or lowering, enabling the operator to quickly adjust and lock jobs. Only one adjustment is necessary; the balance of the job is done with established calibrations. The non-slipping lifter bar deflects apportionately when any material is lifted, creating a tenacious clamping or gripping action of the jaws, that is unbreakable until the job is in position and the lifting pressure released. *Pucel Enterprises, Inc.* For more information, check No. 31 on the postcard on p. 35.

Hydraulic Dynamometer

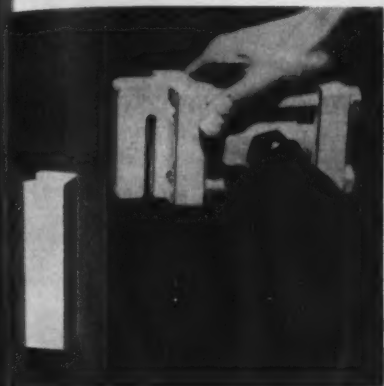
Load testing large electric motors can be accomplished with a hydraulic dynamometer of 30 to 300 ft-lb



capacity. The model is placed directly on the test floor, and is provided with jack screws for raising it to the correct height for connection to the motor to be tested. Adapters for motor shafts ranging from 1 1/8 to 2 7/8 in. are furnished. The laboratory test gage and the foot control cylinder for operating the dynamometer can be placed in the most convenient positions. Dynamometers are built to order. *Wagner Electric Corp.* For more information, check No. 32 on the postcard on p. 35.

Pneumatic Vibrator

A pneumatic vibrator that can be quickly attached to and removed from units that require vibration, where the installation cannot be permanent, is equipped with a rugged milled steel hook that slips



into brackets welded or bolted to the item to be vibrated. The unit is obtainable in a 2-in. piston diameter and operates on 50 to 100 psi continuous line pressure. Number of vibrations and intensity can be controlled by regulating the air pressure. The vibrator weighs 14 lb and measures 6¾ x 4 x 3½ in. Cleveland Vibrator Co. For more information, check No. 33 on the postcard on p. 35.

Drum Lifter

Lifters for handling open and closed steel drums in the vertical position by crane or hoist are of all-steel construction with a heavily



welded chain. They were developed to handle open and closed drums vertically. Palmer Shile Co. For more information, check No. 34 on the postcard on p. 35.


Resume Your Reading on Page 39

strip for action . . .

FOLLANSBEE POLISHED BLUE STRIP will give you real action in the production-line because it's furnished in coils for feeding right into your automatic machines. For the utmost efficiency and economy in continuous operations try this superior Follansbee Polished Blue in coils—the distinctive color is a real asset in any product.

making figurines for faddists

FOLLANSBEE POLISHED BLUE STRIP fits into many types of products, figurines or furnishings or fryers. The uniform-blue, high-gloss finish of Follansbee Polished Blue attracts discriminating buyers. In coils for automatic production, and with mechanical and physical specifications to fit your needs, you'll find it worth while to tool for Follansbee Polished Blue and the other Follansbee Specialty Steels.



FOLLANSBEE STEEL CORPORATION
GENERAL OFFICES, PITTSBURGH 30, PA.
COLD ROLLED STRIP • ELECTRICAL SHEETS • POLISHED BLANK SHEETS
SEAMLESS TUBES ROLL ROOFING
Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee, Sales Agents—Chicago, Indianapolis, St. Louis, Kansas City, Nashville, Houston, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada.
Plants—Follansbee, W. Va., and Toronto, Ohio.
Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfeld, Conn.

...and BLISS is the press buy word at Studebaker

Front fender aprons for the 1949 Studebaker Champion are flanged in a Bliss 500-ton Four Point press, then pierced in a Bliss Two Point gap press.

Restrike and trim operations on Studebaker tire wells are performed simultaneously in one stroke of this new Bliss 500-ton Four Point Enclosed Press.



Double die set-up in another 500-ton Bliss press for restriking and trimming tire wells.

When the major portion of a busy stamping department's 250 presses are Bliss-Built, as they are at Studebaker, you can be sure there's a good reason.

Studebaker's assistant press superintendent says it's "dependability," and explains that Bliss equipment is worked hard—three shifts—year-in and year-out. Yet downtime is "negligible."

Such dependability begins with the prompt and practical on-the-scene assistance that Bliss engineers bring to the working-out of a pressed-metal problem—in matching the press to the job for maximum, low-cost production. And back of it is Bliss' 90-year fund of press-building knowledge, built into its complete line of mechanical and hydraulic presses.

That's why at Studebaker, as among so many major mass-producers, the buy word for presses is "BLISS."

You'll like talking over your pressed-metal problem with a Bliss Sales Engineer. Why not call him in now?

E. W. BLISS COMPANY, TOLEDO 7, OHIO
Mechanical and Hydraulic Presses, Rolling Mills, Container Machinery



BLISS BUILDS MORE TYPES AND SIZES OF PRESSES
THAN ANY OTHER COMPANY IN THE WORLD



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Briefs and Bulletins

old argument—Last week Robert W. Wolcott, president of Lukens Steel Co., answered demands of the scrap industry that limitations on the export of iron and steel scrap be removed. This is seen as a revival of an old argument. The steel industry opposes scrap exports because it says there is no surplus of scrap in this country. But scrap people say that if steel mills won't buy their scrap at prevailing prices they must export it or go out of business.

yankee gas—Arrangements have been made by the newly formed Northeastern Gas Transmission Co. to obtain a supply of natural gas for New England from two of the country's major natural gas pipeline systems. Part of the supply is expected to be available in New England late next year and the remainder late in 1951. The gas will be furnished by the Tennessee Gas Transmission Co. and by the Trans-Continental Gas Pipe Line Corp.

top salesmen—Republic Steel Corp. has made the latest move in the scramble for export business. Next month it is planning to send abroad its senior vice-president and its assistant export manager in quest of orders. These officials are respectively, Norris J. Clarke and L. I. Underwood. They will visit all the nations in western Europe, in addition to Iran, Iraq, Syria, Lebanon and Egypt.

up-grade—After holding about unchanged for 3 weeks business in the Pittsburgh district has resumed the rise which began at mid-July, according to the Bureau of Business Research of the University of Pittsburgh. Most of the advance was caused by better than seasonal gains in the volume of trade. Industrial output and freight shipments were nearly static.

no hurry—A joint House-Senate conference committee last week postponed further action on the freight absorption bill until late in September. The committee agreed after a brief session to recess until after the House returns from its one month vacation.

more power—A new multi-million dollar steam plant of Alabama Power Co. will be dedicated Sept. 16. Ground for the plant, located in East Gadsden, was broken in 1947. The first unit began operating last Spring. The second in July.

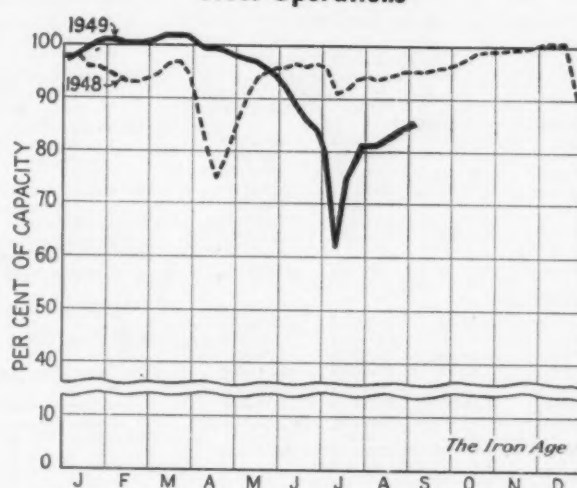
dividends—The iron and steel industry paid out \$32 million more in dividends during the second quarter of 1949 than it did in the same period in 1948, according to Commerce Dept. figures. But payment of dividends in July of this year was \$700,000 less than in July 1948. The auto and oil industries also reported bigger dividends. Total reported dividends in July (\$493.6 million) were only slightly less than those reported in July a year ago.

phantom orders—The National Security Resources Board is now distributing standby schedules for the emergency production of \$20,150,000 worth of gages. The phantom orders are being divided among 12 companies.

good month—Total bookings of fabricated structural steel in July amounted to 124,256 tons. This is the largest for any month this year with the exception of March when 149,079 tons were contracted for.

in blast—Carnegie-Illinois Steel Corp. has fired another blast furnace at its works at Youngstown, making five furnaces active. Seventeen of the 25 furnaces in the area are now in blast, as demand continues to creep back.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
August 21	83.5*	91.5	79.0*	84.0	98.0*	101.0	98.5	101.0	98.0	87.5	79.0	87.0	83.5	85.0
August 28	83.5	92.0	82.0	87.0	102.0	103.0	100.5	101.0	100.0	90.0	80.0	87.0	77.0	86.5

* Revised.

Structural Steel Bookings Rise

First 7 months' orders totaled 82,246 tons . . . Figure is 27.5 pct under same 1948 period . . . Shipments down.

New York—The estimated total bookings of fabricated structural steel, according to reports received by the American Institute of Steel Construction, Inc., showed an upward trend in July. The July bookings, amounting to 124,256 tons, were the largest this year with the exception of March when 149,079 tons were contracted for. The estimated bookings for the first 7 months amounted to 825,246 tons, approximately 27.5 pct less than for the corresponding period of 1948.

July shipments were estimated at 141,120 tons, a decline from June. Shipments for the first 7 months, however, totaled 1,148,197 tons, slightly greater than for the same period of 1948 which totaled 1,126,429 tons.

The backlog (tonnage available for future fabrication) for the next 4 months only, amounts to 605,426 tons.

The complete tabulation of bookings and shipments for the 7 month period is as follows:

	1949	1948	1936/1940
Estimated Total Tonnage for the Entire Industry Ave.			
CONTRACTS CLOSED			
Jan.	130,418	160,634	107,578
Feb.	108,764	130,119	96,280
Mar.	149,079	213,123	124,558
Apr.	98,802	154,082	110,783
May	116,975	141,764	126,237
June	96,952*	162,307	125,835
July	124,256	177,687	152,481
Totals	825,246	1,139,776	843,752
SHIPMENTS			
Jan.	152,746	146,363	92,578
Feb.	145,879	141,556	88,626
Mar.	185,885	167,029	115,031
Apr.	179,206	166,687	123,650
May	171,101	180,915	123,225
June	172,260*	157,109	129,969
July	141,120	160,780	127,422
Totals	1,148,197	1,126,439	800,501
TONNAGE AVAILABLE FOR FABRICATION WITHIN THE NEXT 4 MONTHS			
	605,426	613,200	369,892

*Revised

Fabricated steel awards this week included the following:

- 360 Tons, Philadelphia, shelter shed for Pennsylvania R. R., through McCloskey & Co., Philadelphia, to Max Corbin, Philadelphia.
- 195 Tons, Cook County, Ill., state highway bridge section 066-03-03-4 through Arcol-Midwest Corp., to American Bridge Co., Pittsburgh.

- 155 Tons, Larimer County, Colo., state highway bridge section F1001-15 to E. Burkhardt and Sons Steel and Iron Works, Denver.
- 145 Tons, Newport, Ind., state highway bridge through R. L. Schutt, to Vincennes Steel Co., Vincennes, Ind.
- 140 Tons, Jones County, Ia., state highway bridge section SN-996 to Clinton Bridge Co., Clinton, Ia.
- 140 Tons, Ozaukee County, Wis., state highway bridge section F-0184-1 to Milwaukee Bridge Co., Milwaukee.

Fabricated steel inquiries this week included the following:

- 1425 Tons, Kootenai County, Idaho, Blue Creek Bay Bridge, Bureau of Public Roads, Portland, Ore., bids to Sept. 14.
- 575 Tons, Watsonville, Calif., bridge on Santa Cruz-Watsonville highway, California Div. of Highways, Sacramento, bids to Sept. 21.
- 180 Tons, Crawford County, Pa., bridge, Pennsylvania Dept. of Highways, due Sept. 9.
- 130 Tons, Adams County, Pa., bridge, Pennsylvania Dept. of Highways, due Sept. 9.
- 110 Tons, Tracy, Calif., Tracy switchyard, Central Valley Project, Bureau of Reclamation, Spec. 2768, bids to Sept. 29.

Reinforcing bar awards this week included the following:

- 950 Tons, Cumberland County, Pa., Pennsylvania Turnpike Section 21 B-1, to Johnson, Drake & Piper, Inc., New York City, general contractor.
- 650 Tons, Cumberland County, Pa., Pennsylvania Turnpike Section 22 A-1, to Central Pennsylvania Quarry & Stripping Co., Hazleton, Pa., general contractor.
- 650 Tons, Perry, Juniata and Snyder Counties, Pa., Pennsylvania Dept. of Highways, Routes 195 and 229, to James Julian, Wilmington, Del., general contractor.
- 600 Tons, Wilmington, Del., store for Sears, Roebuck & Co., to Concrete Steel Co., Philadelphia, general contractor.
- 500 Tons, Cumberland County, Pa., Pennsylvania Turnpike Section 21 A-1, to Frank Mashuda, Pittsburgh, general contractor.
- 450 Tons, Seaside to Island Heights, N. J., bridge, Ole Hansen, Pleasantville, N. J., contractor, to Bethlehem Steel Co., Bethlehem.
- 450 Tons, Cumberland County, Pa., Pennsylvania Turnpike Section 21 B-2, to Central Pennsylvania Quarry & Stripping Co., Hazleton, Pa., general contractor.
- 100 Tons, Creston, Ia., steampower plant to Laclede Steel Co., St. Louis.

Reinforcing bar inquiries this week included the following:

- 2325 Tons, Los Angeles, channel construction, Tujunga Wash., Los Angeles District, Corps of Engineers, Inv. VIVENG-04-353-50-7, bids to Oct. 4.
- 465 Tons, Chicago, relocation housing site No. 3.
- 455 Tons, Tracy, Calif., Tracy switchyard, Central Valley Project, Bureau of Reclamation, Spec. 2768, bids to Sept. 29.
- 270 Tons, Elk River, Minn., generating plant.
- 160 Tons, Watsonville, Calif., bridge on Santa Cruz-Watsonville highway, California Div. of Highways, Sacramento, bids to Sept. 21.
- 125 Tons, Kalamazoo, Mich., women's dormitory building.
- 105 Tons, Kootenai County, Idaho, Blue Creek Bay Bridge, Bureau of Public Roads, Portland, Ore., bids to Sept. 14.

The following reinforcing bar awards reported in THE IRON AGE, Aug. 18 p. 138 were reported erroneously and are hereby corrected.

All these awards were reported to have been made to U. S. Steel Supply Corp. Their correct status is as follows:

- 12,000 Tons, Riverdale Junction, N. Dak., Garrison Dam project, not yet placed.
- 400 Tons, Chicago, Herald-American building awarded to J. T. Ryerson and Sons Co., Chicago.
- 160 Tons, Rochester, Minn., Zumbro River Bridge, through L. M. Feller Co., to Paper Calmenson Co., St. Paul.
- 120 Tons, Winnebago, Wis., state hospital, not yet awarded.
- 100 Tons, Chicago, Washington Park Y.M.C.A. building was bid Aug. 22, not yet awarded.
- 100 Tons, Minneapolis, Walte Park School, not yet awarded.

Gathmann, Mold Inventor, Dies

Baltimore—Emil Gathmann, Sr., 76, a well-known figure in the steel industry died last week. Mr. Gathmann, a metallurgical engineer, held more than 100 patents for various types of metals he developed. The steel industry will long remember him for the "big end up" ingot mold.

A native of Chicago, Mr. Gathmann started an engineering firm in New York. Previously he had been head of Bethlehem Steel Co.'s ordnance department at Bethlehem, Pa. He was president of the Gathmann Engineering Co. and Gathmann Research Laboratories.

The American Society for Metals recently gave him an achievement award for distinguished contributions to the metallurgical field. He was a former national chairman of that group, a member of the Iron & Steel Institute, the Mining & Metals Society, and the Royal Society of Engineers of Great Britain.

Will Increase Oil Output

Austin, Tex.—For the first time this year, production of crude oil in Texas will be increased. William J. Murray, chairman of the Railroad Commission, has reported that refiners have requested 47,374 bbl increase in the monthly allowable out of the west Texas fields. Mr. Murray said that he thinks July and August proved to be the low points of crude oil production this year.

Would Keep Big Firms From Buying Assets of Competitors

Washington — The House of Representatives has passed legislation prohibiting corporations from buying the physical assets of competitors in cases where the effect of such purchase might be to "substantially lessen" competition.

Passage of the bill (H.R. 2734) represents culmination of a 20-year-old campaign for such legislation by the Federal Trade Commission. The agency has recommended the amendment of the Clayton Antitrust Act as a barrier to "the increasing trend toward monopoly" in large industries. Existing law bars acquisition of competitors' stock.

Chances of Senate approval of the bill during the present session of Congress are slim. It is considered likely that the upper chamber will defer action on the House-passed measure until 1950.

New Locomotive Cuts Coal Costs

Pittsburgh—Westinghouse Electric Corp. revealed that a new type of coal-burning, electric locomotive that will use only half as much fuel as the conventional steam engine and yet pull a freight train 65 mph will soon be built for Norfolk & Western Ry. The locomotive will be constructed by Baldwin Locomotive Works in collaboration with Westinghouse and Babcock & Wilcox Co. The new 1500 hp locomotive for the first

time will put a coal-burner on an equal footing with diesel electric as far as fuel costs and operating efficiency are concerned.

Key to the engine's remarkable efficiency will be a radically new high pressure, water-tube boiler. Coal-fired, it will produce steam pressure of 600 psi which is about double that of the ordinary steam locomotive boiler. Because of this high pressure, less steam—thus less fuel—will be needed to operate the steam turbine that runs the locomotive's electric generator. This direct current generator, in turn, will operate the 12 electric driving motors that are to be mounted, one on each axle of the locomotive.

ECA Approves Purchase Orders for Machine Tools

Washington — Purchase orders for machine tools, construction and mining equipment, metalworking machinery, and tractors, largely for 1952 delivery, amounting to nearly \$35 million, were approved by the Economic Cooperation Administration recently.

All of this figure, however, does not represent new business. Some of it, nearly a third, in fact, is merely the carrying over of orders which were originally scheduled for 1948 or 1949 delivery.

Nearly \$13 million in machine tool purchases were approved, largely for 1952 delivery—\$9.7 million for Italy and the remainder for France.

Italian Steel Projects Receive ECA Assistance

Washington — Projects for reconstruction and modernization of two Italian steel plants which were wrecked during the war by Allied bombing and subsequent German demolition have been approved by the Economic Cooperation Administration.

The projects provide for ECA assistance in rebuilding steel plants of ILVA, a subsidiary of Finsider, at Bagnoli and Piombino, Italy. (THE IRON AGE, Apr. 14, 1949, p. 130.)

Costs of the reconstruction and modernization program at the two plants is estimated at the equivalent of \$57,000,000, including \$12,007,000 in ECA assistance funds, 12,880,000,000 lire in ECA counterpart funds, and an equal amount of lire from private sources.

ECA assistance funds consist of \$4,807,000 for the Bagnoli project and \$7,200,000 for the Piombino project. Counterpart funds consist of 3,101,000,000 lire for the Bagnoli project and 9,779,000,000 lire for the Piombino project.

ECA funds will be used for the purchase of equipment in the United States needed for the reconstruction and modernization of a blast furnace, a semicontinuous billet mill, a rod mill, a semicontinuous hot strip mill, a blooming mill, an openhearth furnace and soaking pits.

Reconstruction of the Piombino plant since the war, which has required the expenditure of about 7,000,000,000 lire, is more than half completed.

AMERICAN IRON AND STEEL INSTITUTE			Blast Furnace Capacity and Production—Net Tons						JULY - 1949		
			Month								
	Number of companies	Annual blast furnace capacity	PRODUCTION								
			PIG IRON		FERRO MANGANESE AND SPIGEL		TOTAL				
			Current month	Year to date	Current Month	Year to date	Current month	Year to date	Percent of capacity		
									Current month	Year to date	
DISTRIBUTION BY DISTRICTS:											
Eastern	12	13,353,580	844,584	7,115,188	16,629	196,622	861,213	7,311,810	76.1	94.3	
Pittsburgh-Youngstown	17	26,625,920	1,435,009	13,650,469	16,829	149,528	1,451,838	13,799,997	64.3	89.2	
Cleveland-Detroit	6	6,984,600	401,371	3,669,459	-	-	401,371	3,669,459	67.8	90.4	
Chicago	7	15,655,390	933,440	7,743,842	6,277	23,535	939,717	7,767,377	70.8	86.4	
Southern	9	5,010,060	341,718	2,788,973	6,979	48,714	348,697	2,837,687	82.1	97.5	
Western	4	2,912,300	170,475	1,428,672	-	-	170,475	1,428,672	69.1	84.4	
TOTAL	37	70,541,850	4,126,597	36,396,603	46,714	418,399	4,173,311	36,815,002	69.8	89.8	

Nonferrous METALS OUTLOOK

Market Activities

Sales of copper, lead and zinc fairly steady . . . Sales pressure is off the markets . . . Current and pending strikes worry producers and consumers . . . Tin futures sell below spot market



by

John Anthony

New York—Sales offices are taking business in copper, lead and zinc at fairly stable rates. But there is no sharp surge of demand for any of these metals which could put to the test the present rates of production.

Consumers are generally hesitant about ordering metals in substantial tonnages when there is so much uncertainty about future business and the labor picture. Strangely enough, the steel wage negotiations have had a very significant effect on the metals markets. Consumers are not anxious to overload themselves with metals when they may find their steel supplies cut off. And there are several present and pending strike actions in the industry that are definitely tied to the outcome of the steel pattern.

Strike Prospects Beset Industry

The strike of refinery workers at U. S. Metals Refining Co. at Carteret, N. J., has been underway for a full two months. This strike has caused a shortage of certain copper shapes to the extent of 11,000 tons a month. The loss of silver production by this refinery raised the domestic silver market by 1½¢ last week.

The week-old strike at the Kellogg, Idaho smelter of the Bunker Hill & Sullivan Mining & Concen-

trating Co. will cost a loss of 4000 to 5000 tons of lead a month. The dispute is over a health and welfare fund which might well result in along shutdown. The company mines have not been closed down, but since there is nowhere else to ship the concentrates, this development may be expected at any time.

The latest developments in the strike picture were the taking of strike votes at the refineries of American Smelting & Refining Co. at Baltimore and Perth Amboy, N. J.; and at the Phelps Dodge Co. plant at Laurel Hill, N. Y. By this action the union was taking steps to comply with the requirements of the Taft-Hartley law to permit striking after the end of the steel negotiations.

Calumet & Hecla Consolidated Mining Co. is attempting to reopen its Michigan mines, closed down for the past 4 months. The company presented a proposition to the workers through the union by

which there would be a 15¢ per hour reduction in wage rates. The company's plan would abandon development work and maintenance to surface equipment. Although the union has not accepted the terms, the management plans to reopen the mines on Sept. 6. A. E. Petermann, vice-president, said that the break-even point was at 19½¢ per lb, and that wage negotiations could be renewed when and if the copper market reached that figure.

Tin Futures Market Opens

The first few days of the open market operations in tin brought brokers some 500 to 600 tons of business at prices ranging from 98¢ to \$1.00 per lb for November and December delivery. Beyond that buyers did not care to commit themselves for fear of the stability of sterling. Although the new regulation calls for allocation of tin, it is learned in the trade that this merely involves the reporting to RFC of private purchases.

NONFERROUS METALS PRICES

	Aug. 24	Aug. 25	Aug. 26	Aug. 27	Aug. 29	Aug. 30
Copper, electro, Conn.	17.025	17.025	17.025	17.025	17.025	17.025
Copper, Lake, Conn.	17.75	17.75	17.75	17.75	17.75	17.75
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	10.00	10.00	10.00	10.00	10.00	10.00
Lead, St. Louis	14.925-14.975	14.925-14.975	14.925-14.975	14.925-14.975	14.925-14.975	14.925-14.975

Note: Quotations are going prices.

Nonferrous Prices

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium, copper, 3.75-4.25% Be	
Beryllium per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars	
per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	17.625
Copper, lake, Conn. Valley	17.75
Copper, U. S. Treas., dollars per oz.	\$35.00
Gold, 99.9%, dollars per troy oz.	\$2.25
Indium, dollars per troy oz.	\$100 to \$110
Iridium, 14.925-14.975	
Lead, New York	15.125
Lead, St. Louis	15.125
Magnesium, 99.3+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask	
f.o.b. New York	\$75 to \$78
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$69 to \$72
Silver, New York, cents per oz.	73.00
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	10.00
Zinc, New York	10.70
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 ingot		
No. 115	14.50*	16.50
No. 120	14.00*	16.00
No. 123	13.50*	15.50
80-10-10 ingot		
No. 305		21.00
No. 315		18.00
88-10-2 ingot		
No. 210		27.50
No. 215		24.50
No. 245	17.00*	19.75
Yellow ingot		
No. 405	12.25*	14.25
Manganese bronze		
No. 421		19.00
* F.o.b. Philadelphia.		

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.75-19.00
0.60 copper, max.	18.50-18.75
Piston alloys (No. 122 type)	16.75
No. 12 alum. (No. 2 grade)	15.50-16.00
108 alloy	16.00-16.25
195 alloy	17.00-17.25
13 alloy	18.50-18.75
AXS-679	16.50
5% Ti, Aluminum, f.o.b., Eddystone, Pa.	
Low copper	31.00
2% copper	22.00

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1-95-97 1/2%	16.75-17.25
Grade 2-92-95%	15.75-16.25
Grade 3-90-92%	14.75-15.25
Grade 4-85-90%	13.75-14.25

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	34%
Electrodeposited	28%
Roller, oval, straight, delivered	31.46
Ball anodes	32%
Brass, 80-20	
Cast, oval, 15 in. or longer	30%
Zinc, oval, 99.886, f.o.b. Detroit	17 1/2
Ball anodes	16%
Nickel 99 pct plus	
Cast	59.00
Roller, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, roller, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	45.00
Copper sulfate, 99.5 crystals, bbl.	11.10
Nickel salts, single or double, 4-100 lb bags, f.o.b. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz lots, per oz.	59
Sodium cyanide, 98 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	6.75
Zinc sulfate, 25 pct, flakes, bbl.	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 33.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: 1/4 in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 25, 36.7¢ to \$1.05; 35 to 37, 44¢ to \$1.53; 47 to 49, 63.5¢ to \$2.20.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, 1/4 to 1 1/8 in., 11S-T3, R317-T4, 49¢ to 35¢; cold-finished, 1/4 to 1 1/2 in., 11S-T3, 37.5¢ to 35.5¢; 1/4 to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled, 1 1/8 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2 1/4 to 3 1/2 in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 66S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Base quantity 30,000 lb

Sheets and Plate: Mn, FSA, 1/4 in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher.

Extruded Round Rod: M, diam in., 1/4 to 0.311, 58¢; 1/2 to 3/4, 46¢; 1 1/4 to 1.749, 43¢; 2 1/4 to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., 1/4 to 0.311, 61¢; 1/2 to 0.749, 48¢; 1 1/4 to 1.749, 44¢; 2 1/4 to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 to 5/16, \$1.14; 5/16 to 3/4, \$1.02; 3/4 to 1, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, 3/4 to 1 1/8, 85¢; 1 1/8 to 2 in., 57¢; 0.165 to 0.219, 3/4 to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	31.30		30.90
Copper, hot-rolled		27.15	
Copper, drawn		28.40	
Low brass	29.47	29.16	32.38*
Yellow brass	28.19	27.88	31.20*
Red brass	29.89	29.58	32.80*
Naval brass	33.13	27.19	28.44
Leaded brass		22.76	26.85
Commercial bronze	30.84	30.53	33.50*
Manganese bronze	36.63	30.54	32.04
Phosphor bronze	50.47	50.72	
Muntz metal	31.15	26.71	27.96
Everdur, Herculex, Olym-			
pie, etc	36.19	35.14	
Nickel silver, 10 pct	39.13	41.41	41.44
Architectural bronze			26.85
* Seamless tubing.			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1/4¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	14 1/2	13 1/2
Yellow brass	13	11
Red brass	13 1/2	12 1/2
Commercial bronze	13 1/2	12 1/2
Manganese bronze	11 1/2	10 1/2
Leaded brass rod ends	11 1/2	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	14.25
No. 2 copper wire	13.25
Light copper	12.25
Refinery brass	12.00*
Radiators	9.00
* Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	14.25
No. 2 copper wire	13.25
Light copper	12.25
No. 1 composition	11.00 to 11.25
No. 1 comp. turnings	10.50 to 10.75
Roller brass	9.25
Brass pipe	10.00
Radiators	9.00 to 9.25
Heavy yellow brass	8.50

Aluminum

Mixed old cast	10.00
Mixed old clips	10.00
Mixed turnings, dry	8.00
Pots and pans	10.00
Low copper	11.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	12 1/2-13
No. 2 heavy copper and wire	11 1/2-12
Light copper	10 1/2-11
Auto radiators (unsweated)	7 1/2-8
No. 1 composition	9-9 1/2
No. 1 composition turnings	8 1/2-8 3/4
Clean red car boxes	7 1/2-8
Cocks and faucets	7 1/2-8
Mixed heavy yellow brass	6 1/2-6 3/4
Old rolled brass	7 1/2-8
Brass pipe	8 1/2-8 3/4
New soft brass clippings	10-10 1/2
Brass rod ends	7 1/2-8
No. 1 brass rod turnings	7 1/2-7 3/4

Aluminum

Alum, pistons and struts	4 1/2-4 3/4
Aluminum crankcases	6 1/2-7
2S aluminum clippings	10 1/2-11
Old sheet and utensils	6 1/2-7
Borings and turnings	3 1/2
Misc. cast aluminum	6 1/2-7
Dural clips (24S)	6 1/2-7

Zinc

New zinc clippings	5 1/2-6
Old zinc	3 1/2-4
Zinc routings	2 1/2-3
Old die cast scrap	2 1/2

Nickel and Monel

Pure nickel clippings	16-17
Clean nickel turnings	14-15
Nickel anodes	16-17
Nickel rod ends	16-17
New Monel clippings	10 1/2-11 1/2
Clean Monel turnings	6-7
Old sheet Monel	8-9
Old Monel castings	7-8
Inconel clippings	10-11
Nickel silver clippings, mixed	6-7
Nickel silver turnings, mixed	5 1/2-6

Lead

Soft scrap, lead	11 1/2-11 3/4
Battery plates (dry)	6 1/2-6 3/4

Magnesium

Segregated solids	9-10
Castings	5 1/2-6 1/2

Miscellaneous

Block tin	73-75
No. 1 pewter	47-49
No. 1 auto babbitt	40-42
Mixed common babbitt	11 1/2-12
Solder joints	10 1/2-11
Siphon tops	45-47
Small foundry type	12 1/2-13 1/4
Monotype	12-12 1/2
Lino. and stereotype	11 1/2-12
Electrotype	10 1/2-11
New type shell cuttings	10 1/2-10 3/4
Hand picked type shells	4
Lino. and stereo. dross	5 1/2-5 3/4
Electro. dross	4 1/2-4 3/4

MARKETS—PRICES—TRENDS



SCRAP Iron & Steel

Sharp Price Advances in All Major Markets

Scrap prices again moved ahead this week in all major markets. There was very little open market mill buying and higher prices were attributed mainly to bids on industrial lists and broker-dealer transactions. Historically, the scrap market is always stronger after a major strike and the scrap trade has taken this fact into consideration. The top quotation of No. 1 steel was up \$3.00 in St. Louis; in Boston it was up \$2.50; in Chicago, New York, Detroit and Cincinnati it was up \$2.00; in Cleveland it was up \$1.50; and in Pittsburgh and Philadelphia it was up \$1.00. THE IRON AGE scrap composite rose \$1.41 per gross ton this week to \$23.33. This is the largest advance in the composite for a single week this year.

PITTSBURGH — Dealer-broker sales provided the only activity here in the heavy melting grades. Mills kept out of the market, apparently to await outcome of the steel-labor hearings. However, broker buying at \$24.00 to cover old orders established a top of \$24.50 for No. 1 heavy melting, up \$1.00 from last week. Other melting grades went up accordingly. Machine shop turnings were up 50¢. Cast grades held strong, with No. 1 machinery cast up \$2.00 to \$37.00.

CHICAGO—The past week's market continued its strong tendency. A little mill buying substantiated its strength but

what the trade is calling "fabulous prices" is attributed to brokers. All over the Wisconsin, Michigan, Illinois and Indiana areas, plants generating good No. 1 heavy melting and No. 1 factory bundles were getting from \$24.00 to \$25.50 a gross ton, f.o.b. their plants. In Detroit, Chicago interests are paying top dollar and that is over \$7.00 away—all rail. One large purchase there will be shipped by water. The only major item still sluggish is No. 2 dealers' bundles. Railroad lists again pushed higher. Carnegie's new price for September delivery is already considered as a bad order by some Chicago brokers.

PHILADELPHIA—Despite the uncertainty of the steel outlook because of the possibility of a strike, the scrap market was very strong last week. Brokers were paying more money to cover old orders. Plant scrap was going at prices higher than previous quotations. Some dealers are still staying away from the market, expecting to sell at higher prices. An appraisal of the market indicates that all grades should be quoted from 50¢ to \$1.50 higher. Mills have not begun to place business at the higher prices, but cast is selling at increases of \$1.00 and \$2.00.

NEW YORK—The strong undertone which persisted in the market here for the past month showed itself this week when the top quotation for No. 1 heavy melting rose another \$2.00 to \$16.00 to \$17.00. The trade reported that the larger demand and small amount of scrap in dealers' yards has been responsible for the sudden rise in prices. The foundries have been increasing their buying tempo of the cast grades and this has been reflected by some price increases in these items.

DETROIT—A very strong market continued here. Brokers were bidding prices up on most items and No. 1 bundles were

very hot. Chicago interests are buying heavily in bundles and No. 2 heavy melting. Some of this material is slated for water shipment. Local mills can sell some of their scrap at nice profits to brokers in this area as well as Chicago and Pittsburgh. The drive is for quality industrial scrap and at the moment little or no interest is apparent in dealer grades.

CLEVELAND—Despite disinterest, feigned or otherwise, on the part of some major consumers, the market here and in the Valley was hotter than a two-dollar pistol this week. What appeared to be an all-out effort to corner the market was being made by some operators who are seemingly prepared to run it through the roof, or a possible \$35.00, and then break it. Many brokers report they can't buy because the dealers are hot and hanging on, and short covering. According to some, it is about over. On the other hand, the strength of No. 2 grades is primarily sympathetic.

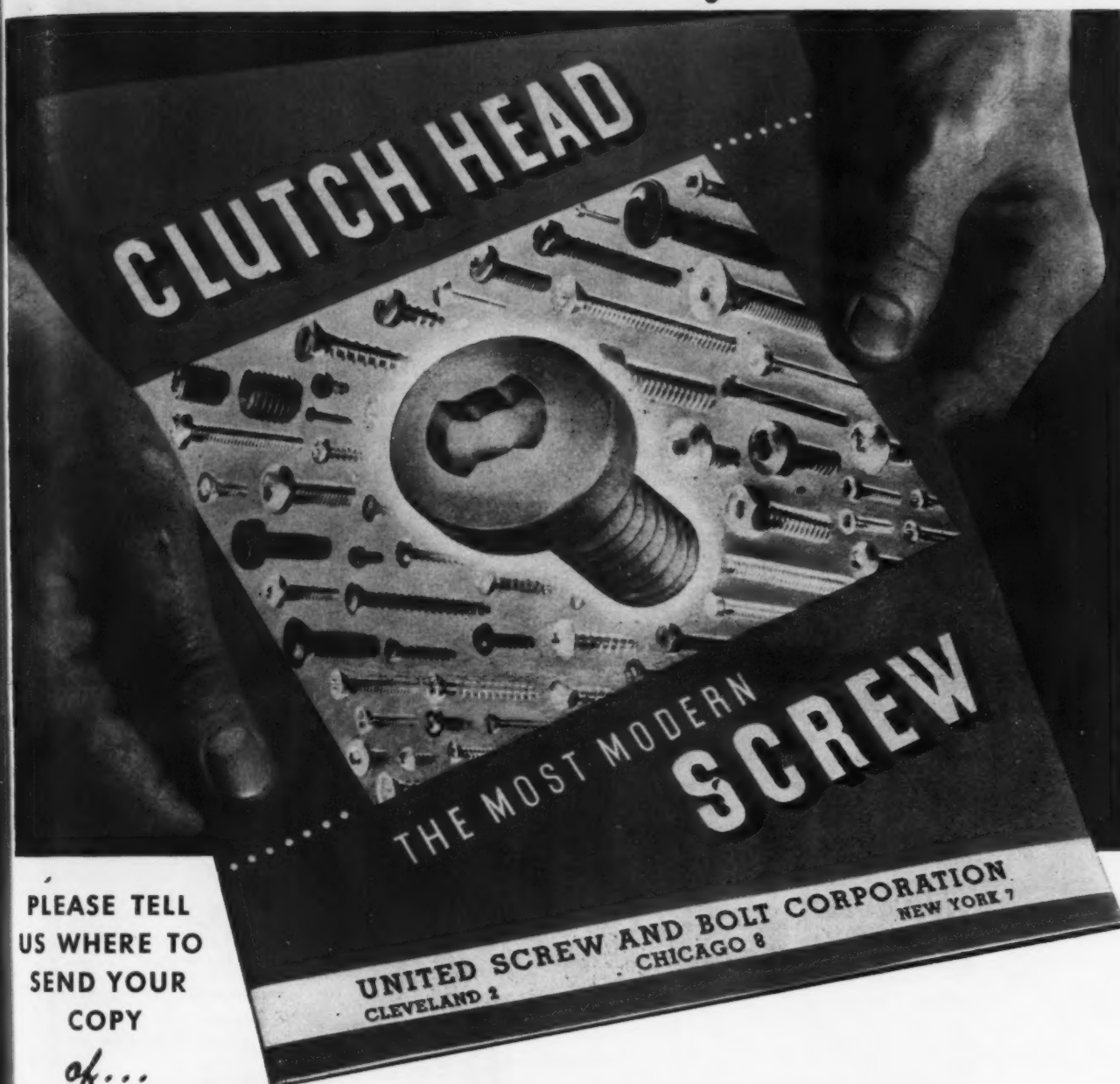
BOSTON—Firm prices and more activity have finally made an appearance here in both the scrap and cast grades. For cast it is the first move in many months as compared with the other scrap grades. No. 1 heavy melting is at a new high for the current move, being quoted at \$14.00 to \$14.50.

BUFFALO—Mill consumers remained on the sidelines of the open market here during the last week and concentrated their activities in surplus districts at prices above the local asking levels. One of the leading interests paid the equivalent of about \$28.50 delivered Buffalo for No. 1 plant bundles in Detroit and over \$24.00 delivered for No. 2 steel in New England. Meantime, a local dealer offered to sell No. 2 heavy melting at \$22.00 and No. 1 at \$25.00, but the offer was rejected and subsequently withdrawn.

CINCINNATI—From a broker-dealer angle, the market here looks good but at press time the mills were not having any. The market is gaining sympathetic strength steadily from other districts. One sale of No. 2 steel at \$21.00 delivered to a remote customer was reported here, but otherwise the trade is waiting. Foundry grades are active at quoted prices.

BIRMINGHAM—The undertone for steel grades is very strong in this market but the price for cast has dropped \$1.00. When No. 1 cupola cast reached \$35.00 as it did last week, foundries increased their purchases of pig iron. Despite brisk demand for all grades of material, movement is on the light side since dealers cannot replace their accumulations at going prices. Just about all the scrap moving is being used in the Birmingham district.

ST. LOUIS—One mill came into the market for No. 2 heavy melting at \$22.00 early this week. A district mill has purchased approximately 10,000 tons of melting steel from a Detroit industry, which tonnage is to be moved here by barge. Brokers are buying speculatively and are said to be offering No. 2 heavy melting steel and bundles sheets at prices ranging from \$22.00 to \$28.00 a ton. With railroad curtailing their rail replacement program, there is a shortage of rerolling rails.



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Pittsburgh

No. 1 hvy. melting	\$24.00 to \$24.50
No. 2 hvy. melting	22.00 to 22.50
No. 1 bundles	24.00 to 24.50
No. 2 bundles	20.00 to 20.50
Machine shop turn.	16.00 to 16.50
Mixed bor. and ms. turn.	16.00 to 16.50
Shoveling turnings	18.00 to 18.50
Cast iron borings	17.50 to 18.00
Low phos. plate	25.50 to 26.00
Heavy turnings	19.50 to 20.50
No. 1 RR. hvy. melting	24.50 to 25.00
Scrap rails, random lgth.	27.00 to 28.00
Rails 2 ft and under	31.00 to 32.00
RR. steel wheels	25.00 to 27.00
RR. spring steel	25.00 to 27.00
RR. couplers and knuckles	25.00 to 27.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	32.00 to 33.00
Heavy breakable cast.	26.00 to 27.00
Malleable	29.00 to 30.00

Chicago

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 factory bundles	24.00 to 25.00
No. 1 dealers' bundles	23.00 to 24.00
No. 2 dealers' bundles	19.00 to 20.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	15.00 to 16.00
Low phos. forge crops	28.00 to 29.00
Low phos. plate	26.00 to 27.00
No. 1 RR. hvy. melting	27.00 to 28.00
Scrap rails, random lgth.	33.00 to 34.00
Rerolling rails	39.00 to 40.00
Rails 2 ft and under	38.00 to 39.00
Locomotive tires, cut	38.00 to 39.00
Cut bolsters & side frames	31.00 to 32.00
Angles and splice bars	32.00 to 33.00
RR. steel car axles	38.00 to 39.00
No. 3 steel wheels	30.00 to 31.00
RR. couplers and knuckles	31.00 to 32.00
No. 1 machinery cast.	41.00 to 42.00
No. 1 agricul. cast.	38.00 to 39.00
Heavy breakable cast.	33.00 to 34.00
RR. Grate bars	29.00 to 30.00
Cast iron brake shoes	29.00 to 30.00
Cast iron car wheels	34.00 to 35.00
Malleable	34.00 to 35.00

Philadelphia

No. 1 hvy. melting	\$21.00 to \$21.50
No. 2 hvy. melting	19.00 to 19.50
No. 1 bundles	21.00 to 21.50
No. 2 bundles	18.00 to 18.50
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Low phos. punchings, plate	24.00 to 25.00
Low phos. 5 ft and under	24.00 to 25.00
Low phos. bundles	21.00 to 21.50
Hvy. axle forge turn.	21.00 to 21.50
Clean cast chem. borings	19.50 to 20.50
RR steel wheels	24.00 to 25.00
RR spring steel	24.00 to 25.00
No. 1 machinery cast.	32.00 to 33.00
Mixed yard cast	29.00 to 30.00
Heavy breakable cast	27.00 to 28.00
Cast iron carwheels	30.00 to 31.00
Malleable	27.00 to 28.00

Cleveland

No. 1 hvy. melting	\$22.00 to \$22.50
No. 2 hvy. melting	19.00 to 19.50
No. 1 bushelings	22.00 to 22.50
No. 1 bundles	22.00 to 22.50
No. 2 bundles	17.00 to 17.50
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	17.00 to 17.50
Shoveling turnings	17.00 to 17.50
Cast iron borings	17.00 to 17.50
Low phos. 2 ft and under	24.50 to 25.00
Steel axle turn.	22.00 to 22.50
Drop forge flashings	22.00 to 22.50
No. 1 RR. hvy. melting	23.00 to 24.00
Rails 3 ft. and under	36.00 to 37.00
Rails 18 in. and under	37.00 to 38.00
No. 1 machinery cast.	36.00 to 37.00
RR. cast	36.00 to 37.00
RR grate bars	30.00 to 31.00
Stove plate	33.00 to 34.00
Malleable	32.00 to 33.00

Youngstown

No. 1 hvy. melting	\$24.50 to \$25.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	24.50 to 25.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$19.50 to \$20.00
Machine shop turn.	16.50 to 17.00
Shoveling turnings	19.50 to 20.00
Cast iron borings	19.50 to 20.00
Low phos. plate	27.00 to 27.50

Buffalo

No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	18.50 to 19.50
No. 1 busheling	18.50 to 19.50
No. 1 bundles	21.00 to 22.00
No. 2 bundles	16.50 to 17.50
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	14.50 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.50 to 15.00
Low phos. plate	23.00 to 24.00
Scrap rails, random lgth.	24.00 to 25.00
Rails 18 in. and under	29.00 to 30.00
RR. steel wheels	25.00 to 26.00
RR. spring steel	25.00 to 26.00
RR. couplers and knuckles	25.00 to 26.00
No. 1 cupola cast	30.00 to 31.00
Mixed yard cast	27.00 to 28.00
Stove plate	27.00 to 28.00
Small indus. malleable	19.50 to 20.50

Birmingham

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	22.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Bar crops and plate	28.00
Structural and plate	28.00
No. 1 RR. hvy. melt.	23.00
Scrap rails, random lgth.	28.00 to 29.00
Rerolling rails	30.00 to 31.00
Rails 2 ft and under	33.00
Angles & splice bars	30.00
Std. steel axles	26.00 to 27.00
No. 1 cupola cast	33.50 to 34.00
Stove plate	28.00 to 29.00
Cast iron carwheels	23.00 to 24.00

St. Louis

No. 1 hvy. melting	\$24.00 to \$25.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 bundled sheets	21.00 to 22.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Rails, random lengths	26.00 to 27.00
Rails 3 ft and under	30.00 to 31.00
Locomotive tires, uncut	22.00 to 23.00
Angles and splice bars	30.00 to 31.00
Std. steel car axles	32.00 to 33.00
RR. spring steel	24.00 to 25.00
No. 1 machinery cast.	32.00 to 34.00
Hvy. breakable cast.	25.00 to 26.00
Cast iron brake shoes	28.00 to 29.00
Stove plate	26.00 to 27.00
Cast iron car wheels	30.00 to 32.00
Malleable	27.00 to 29.00

New York

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$16.00 to \$17.00
No. 2 hvy. melting	14.50 to 15.50
No. 2 bundles	13.50 to 14.00
Machine shop turn.	7.50 to 8.00
Mixed bor. and turn.	7.50 to 8.00
Shoveling turnings	8.50 to 9.00
Clean cast chem. bor.	14.00 to 14.50
No. 1 machinery cast.	22.00 to 24.00
Mixed yard cast.	20.00 to 21.00
Charging box cast	20.00 to 21.00
Heavy breakable cast	20.00 to 21.00
Unstrp. motor blocks	16.50 to 17.00

Boston

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$14.00 to \$14.50
No. 2 hvy. melting	13.00 to 13.50
No. 1 bundles	14.00 to 14.50

No. 2 bundles	\$13.00 to \$13.50
Machine shop turn.	7.00 to 7.50
Mixed bor. and turn.	6.50 to 7.00
Shoveling turnings	7.50 to 8.00
No. 2 busheling	9.50 to 10.00
Clean cast chem. borings	11.00 to 12.00
No. 1 machinery cast.	28.00 to 30.00
No. 2 machinery cast.	23.00 to 23.50
Heavy breakable cast.	17.50 to 18.00
Stove plate	19.50 to 20.50

Detroit

Brokers' buying prices per gross ton, on cars:

No. 1 hvy melting	\$21.00 to \$22.00
No. 2 hvy. melting	17.00 to 18.00
No. 1 bundles	21.00 to 22.00
New busheling	19.00 to 20.00
Flashings	19.00 to 20.00
Machine shop turn.	10.50 to 11.00
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	12.00 to 12.50
Cast iron borings	12.00 to 12.50
Low phos. plate	19.00 to 20.00
No. 1 cupola cast	32.00 to 33.00
Heavy breakable cast	27.00 to 28.00
Stove plate	24.00 to 25.00
Automotive cast	32.00 to 33.00

Cincinnati

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$19.50 to \$20.00
No. 2 hvy. melting	18.50 to 19.00
No. 1 bundles	19.50 to 20.00
No. 2 bundles	17.50 to 18.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. under	27.00 to 27.50
Rails, random lengths	29.00 to 30.00
Rails, 18 in. and under	34.00 to 35.00
No. 1 cupola cast	33.00 to 34.00
Hvy. breakable cast	29.00 to 30.00
Drop broken cast	37.00 to 38.00

San Francisco

No. 1 hvy. melting	\$17.00
No. 2 hvy. melting	15.00
No. 1 bundles	13.00
No. 2 bundles	13.00
No. 3 bundles	10.00
Machine shop turn	9.00
Elec. fur. 1 ft and under	25.00
No. 1 RR. hvy. melting	17.00
Scrap rails, random lgth.	17.00
No. 1 cupola cast.	\$20.00 to 25.00

Los Angeles

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	12.00
Mach. shop turn.	12.00
Elec. fur. 1 ft and under	30.00
No. 1 RR. hvy. melting	20.00
No. 1 cupola cast.	\$30.00 to 31.00

Seattle

No. 1 hvy. melting	\$18.00
No. 2 hvy. melting	16.00
No. 1 bundles	13.00
No. 2 bundles	13.00
No. 3 bundles	12.00
Elec. fur. 1 ft and under	21.00
RR. hvy. melting	19.00
No. 1 cupola cast.	\$20.00 to 27.00
Heavy breakable cast.	20.00

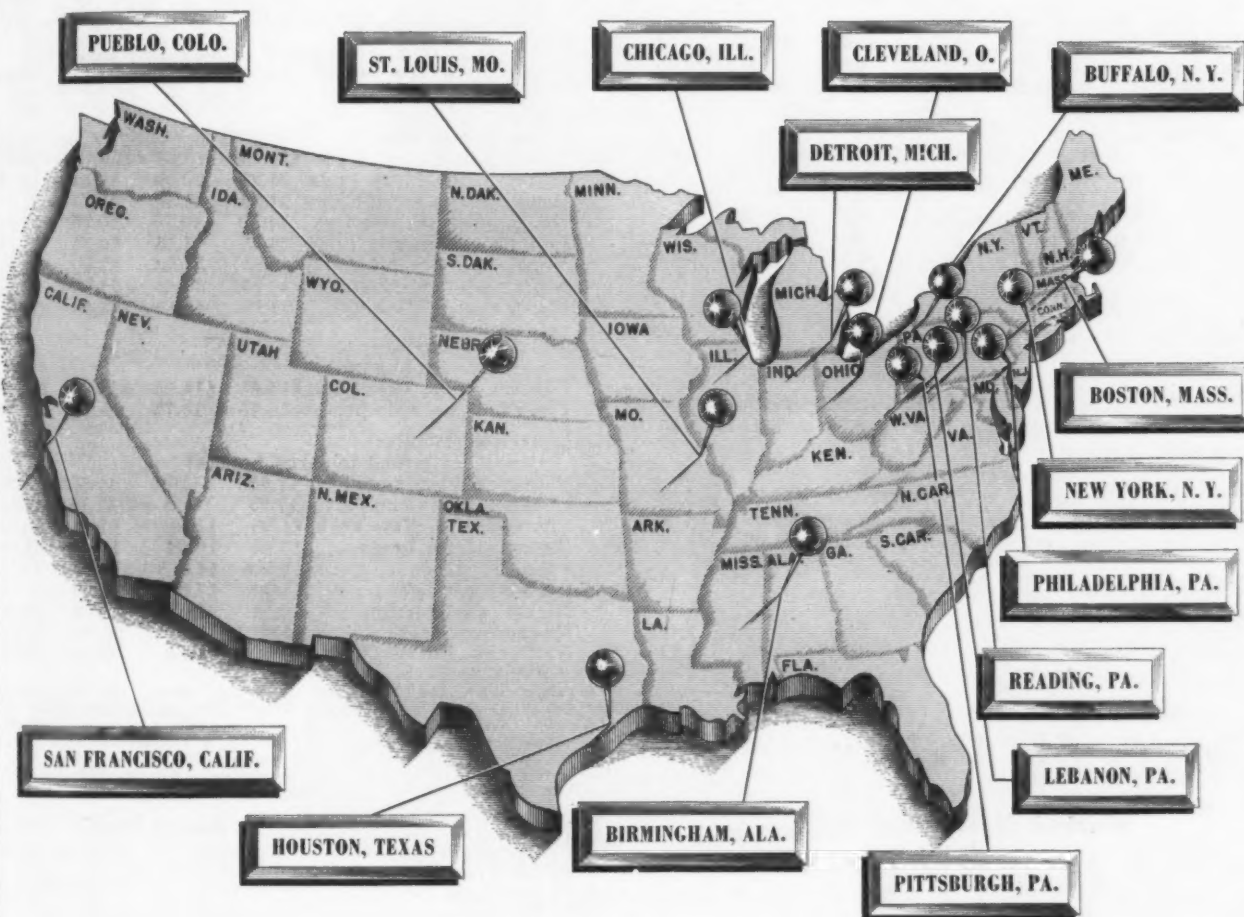
Hamilton, Ont.

Cast grades f.o.b. shipping point:

No. 1 hvy. melting	\$20.00
No. 1 bundles	20.00
No. 2 bundles	19.50
Mechanical bundles	18.00
Mixed steel scrap	16.00
Mixed bor. and turn.	14.00
Rails, remelting	20.00
Rails, rerolling	23.00
Bushelings	14.50
Bush., new fact, prep'd.	13.00
Bush., new fact, unprep'd.	12.00
Short steel turnings	14.00
Cast scrap	\$33.00 to 35.00

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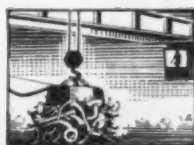
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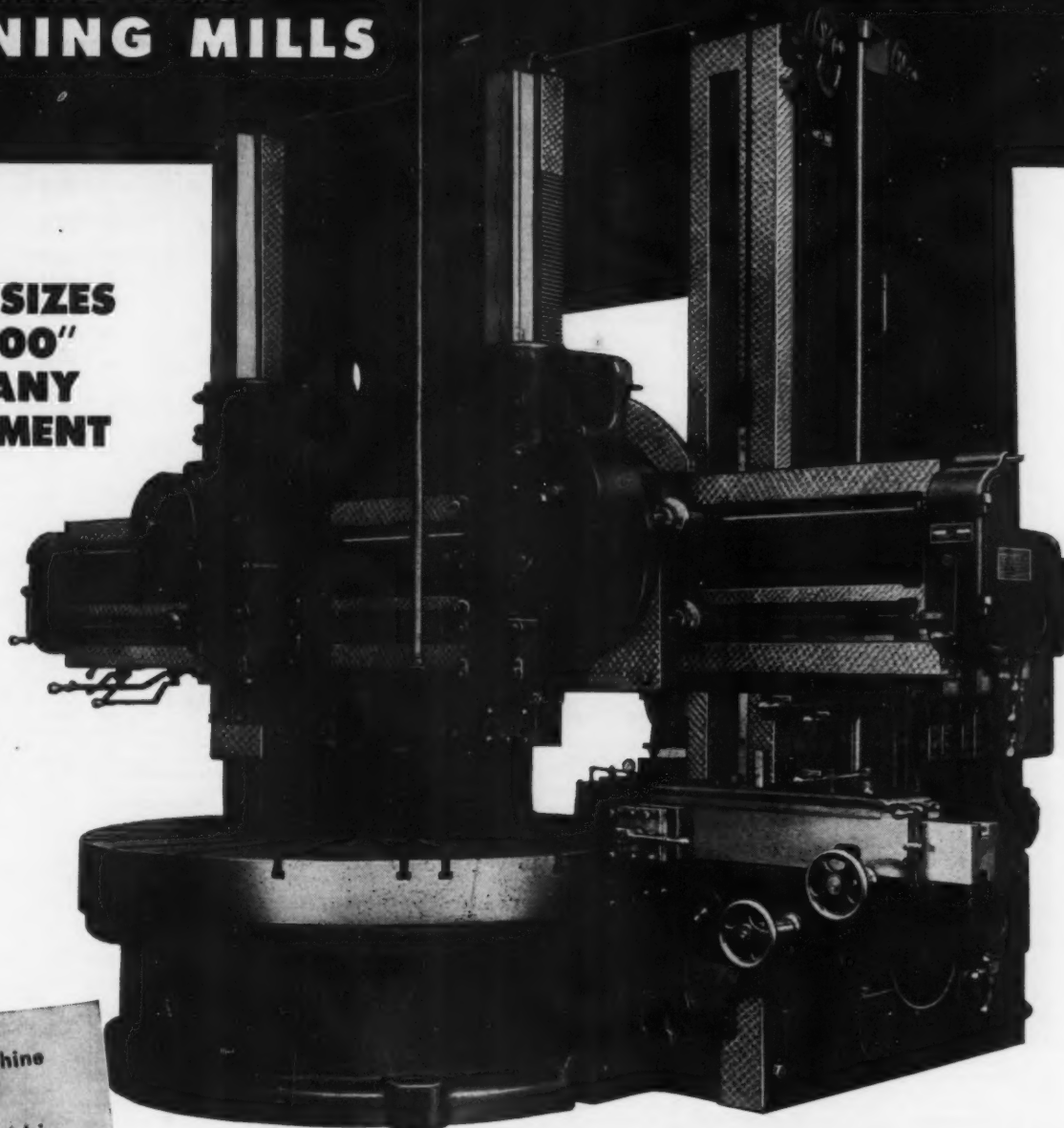
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As in other Betts Boring and Turning Mills, this 100" mill is designed to provide a rugged, simplified general purpose tool that successfully combines accuracy, speed and power. Its features, many of which are exclusive, all contribute to this machine's reputation for outstanding performance; its production speed and accuracy, long operating life, safety of operation, convenience of control and all-around dependability under exacting operating conditions.

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CONSOLIDATED MACHINE TOOL CORPORATION

ROCHESTER 10, NEW YORK

STEEL PRICES

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas															
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Young- stown	Spar- rows Point	Granite City	Middle- town, Ohio			Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS Carbon forging	\$50.00												\$50.00			
Alloy	\$51.00							(per net ton)					\$51.00			
BILLETS, BLOOM'S SLABS Carbon, rerolling ¹⁰	\$52.00				\$52.00	\$52.00		(per net ton)						\$52.00		\$71.00
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00		(per net ton)					\$61.00	\$61.00		\$80.00
Alloy	\$63.00	\$63.00				\$63.00		(Bethlehem, Canton, Massillon = \$63.00) (per net ton)					\$63.00			\$82.00
PIPE SKELP	3.25						3.25				Warren = 3.25					
WIRE RODS	3.40	3.40		3.40	3.40		3.40	3.50			Worcester 3.70			3.40	4.05 ¹¹ 4.20 ¹²	
SHEETS Hot-rolled ⁴	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95 ¹³	4.15
Cold-rolled	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00		4.20		Pittsburg, Cal. = 4.95	4.90
Galvanized (10 gage)	4.40	4.40	4.40		4.40		4.40	4.40	Canton = 4.40	4.40	Ashland = 4.40				5.15 ¹³	
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40			4.70			
Long ternes (10 gage)	4.80		4.80							4.80						
STRIP Hot-rolled ¹	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		3.25	Warren = 3.25		3.45		4.00 to 4.25	4.40
Cold-rolled ²	4.00	4.15		4.00		4.00	4.00	4.00			New Haven = 4.50 Warren = 4.00 to 4.25		4.20 to 4.25			4.90
TINPLATE Cokes, 1.50 lb. ³ base box Electrolytic 0.25, 0.50, 0.75 lb. box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95		Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.50	
	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price															
TERNES MFG., special coated	Deduct \$1.10 from 1.50 lb. coke base box price															
BLACKPLATE CANMAKING 55 to 128 lb.	Deduct \$2.00 from 1.50 lb. coke base box price															
BLACKPLATE, h.e., 29 ga. ⁶	5.30	5.30	5.30					5.40			Warren, Ohio = 5.30					
BAR'S Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35		3.55	3.35	4.05 to 4.10 ¹⁴	4.00
Reinforcing ⁵	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35			3.35	4.05 to 4.10 ¹⁴	4.00
Cold-finished ⁶	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00						4.30			
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75			Bethlehem, Canton, Massillon = 3.75			4.05	3.75	4.80 ¹²	4.75
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65			Massillon = 4.65	Worcester 4.95					
PLATE Carbon steel ⁹	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	Coatesville = 3.50, Claymont = 3.50 Geneva = 3.40, Harrisburg = 3.50			3.65	3.40	4.30 ¹⁴	4.00
Floor plates	4.55	4.55		4.55						Conshohocken, Harrisburg = 4.55						
Alloy	4.40	4.40	4.40							Coatesville = 4.50						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30				Bethlehem = 3.30, Geneva, Utah = 3.25				3.30	3.80 to 3.90 ¹⁴	3.80
MANUFACTURERS' WIRE ⁷ Bright	4.15	4.15		4.15	4.15		4.15	4.25		Duluth = 4.15, Worcester = 4.45				4.15	5.15 ¹¹	
Spring (high carbon)	5.20	5.20		5.20				5.30		Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15	
PILING, Steel sheet	4.05	4.05				4.05										

Steel prices shown above are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Widths up to 12-in. inclusive. (2) 0.25 carbon and less. (3) Cokes, 1.25 lb. deduct 25¢ per base box. (4) 18 gage and heavier. (5) For straight length material only from producers to fabricators. (6) Also shafting. For quantities of 40,000 lb and over. (7) Carload lot in manufacturing trade. (8) Hollowware enameling gages 29 to 31 only. (9) Produced to dimensional tolerances in AISI Manual Sec. 6. (10) Slab prices subject to negotiation in most cases. (11) San Francisco only. (12) Los Angeles only. (13) San Francisco and Los Angeles only. (14) Seattle only. (15) Seattle and Los Angeles only.

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, about \$200.00 per net ton.

Standard, Threaded and Coupled

Steel, butt weld*	Black	Galv.
1/4-in.	43 to 41	26 1/2 to 24 1/2
1/2-in.	46 to 44	30 1/2 to 28 1/2
1-in.	48 1/2 to 46 1/2	33 1/2 to 31 1/2
1 1/4-in.	49 to 47	34 to 32
1 1/2-in.	49 1/2 to 47 1/2	34 1/2 to 32 1/2
2-in.	50 to 48	35 to 33
2 1/2 to 3-in.	50 1/2 to 48 1/2	35 1/2 to 33 1/2

Steel, lap weld		
2-in.	39 1/2	26 to 24
2 1/2 to 3-in.	43 1/2 to 42 1/2	28 to 27
3 1/2 to 6-in.	46 1/2 to 42 1/2	31 to 27

Steel, seamless		
2-in.	38 1/2 to 27	23 to 11 1/2
2 1/2 to 3-in.	41 1/2 to 32 1/2	26 to 17
3 1/2 to 6-in.	43 1/2 to 38 1/2	28 to 23

Wrought iron, butt weld		
1/4-in.	+20 1/2	+47
1/2-in.	+10 1/2	+36
1-in.	+4 1/2	+27
1 1/4-in.	+1 1/2	+23 1/2
2-in.	—	+23
3-in.	—	+23

Wrought iron, lap weld		
2-in.	+7 1/2	+31
2 1/2 to 3 1/2-in.	+5	+26 1/2
4-in.	list	+20 1/2
4 1/2 to 8-in.	+2	+22

Extra Strong, Plain Ends

Steel, butt weld		
1/4-in.	42 to 40	27 to 25
1/2-in.	46 to 44	31 to 29
1-in.	48 to 46	34 to 32
1 1/4-in.	48 1/2 to 46 1/2	34 1/2 to 32 1/2
1 1/2-in.	49 to 47	35 to 33
2-in.	49 1/2 to 47 1/2	35 1/2 to 34 1/2
2 1/2 to 3-in.	50 to 48	36 to 34

Steel, lap weld		
2-in.	39 1/2 to 38 1/2	25 to 24
2 1/2 to 3-in.	44 1/2 to 42 1/2	30 to 28
3 1/2 to 6-in.	48 to 44	33 1/2 to 31 1/2

Steel, seamless		
2-in.	37 1/2 to 32 1/2	23 to 18
2 1/2 to 3-in.	41 1/2 to 36 1/2	27 to 23
3 1/2 to 6-in.	45	30 1/2

Wrought iron, butt weld		
1/4-in.	+16	+40
1/2-in.	+9 1/2	+34
1 to 2-in.	— 1 1/2	+23

Wrought iron, lap weld		
2-in.	+4 1/2	+27 1/2
2 1/2 to 4-in.	— 5	+16
4 1/2 to 6-in.	— 1	+20 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, out length 4 to 24 ft inclusive.

OD	Gage	Seamless	Electric Weld
in in.	BWG	H.R.	C.D.
2	13	\$19.18	\$22.56
2 1/2	12	25.79	30.33
3	12	28.68	33.76
3 1/2	11	35.85	42.20
4	10	44.51	52.35

CAST IRON WATER PIPE

	Per net ton
4 to 24-in., del'd Chicago	\$95.70
6 to 24-in., del'd N. Y.	\$92.50 to 97.40
6 to 24-in., Birmingham	\$2.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	109.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
1/2 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
3/4 in. & larger x 6 in. shorter	34
All diam., longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)	
1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/4 to 1 1/2 in. inclusive	32
1 1/2 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowances of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	41	
1/2 in. and smaller	38	
1/2 in. through 1 in.	39	
9/16 in. through 1 in.	37	
1 1/4 in. through 1 1/2 in.	35	37
1 1/2 in. and larger	28	
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

(1/2 in. and larger)	
Base per 100 lb	
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

(7/16 in. and smaller)	
Pct off List	
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

(In packages)	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
1/2 to 1 in. x 6 in., SAE (1035), heat treated	35
Milled studs	19
Flat head cap screws, listed sizes	5
Fillister head cap, listed sizes	28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

Effective CaF ₂ Content:	Base price per net ton
70% or more	\$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per gross ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.	7.9¢ to 9.0¢
New York, ocean bags	
Domestic sponge iron, 98+ % Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+ % Fe	31.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0¢ to \$1.75
Aluminum	27.00¢
Antimony	53.73¢
Brass, 10 ton lots	23.00 to 25.25¢
Copper, electrolytic	27.75¢
Copper, reduced	27.625¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	20.06¢
Manganese	48.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	\$1.15 to \$1.25
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	15.25 to 18.00¢

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$15.50 to \$16.00
Foundry, oven coke	
Buffalo, del'd	\$20.90
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Plainesville, Ohio, f.o.b.	20.90
Erie, del'd	\$21.50 to 23.50
Cleveland, del'd	22.45
Cincinnati, del'd	21.50
St. Paul, f.o.b.	23.50
St. Louis, del'd	20.92
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)	
Fire Clay Brick	
Carloads, Per 1000	
First quality, Pa., Ky., Mo., Ill. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	\$85.00 to 95.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	\$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick	Per Net Ton
Standard chemically bonded, Balt., Chester	\$69.00
Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite	
Std. 1/2-in. grains	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.00 to 56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel							Straight Chromium		
	301	302	303	304	316	321	317	410	418	430
Ingot, re-rolling	12.75	13.50	15.00	15.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, re-rolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.80	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	30.00
Bars, wire, structurals	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.80	34.00	50.50	39.50	44.00	26.00	26.50	26.50
									27.00	
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium					52¢
Oil hardened manganese					29¢
Special carbon					26.5¢
Extra carbon					22¢
Regular carbon					19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

24 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95
Motor	6.70
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb	\$3.20
Joint bars, 100 lb	4.25
Light rails per 100 lb	3.55

Base Price
cents per lb

Track spikes	5.35
Axles	5.20
Screw spikes	8.00
Tie plates	4.05
Tie plates, Pittsburgh, Calif.*	4.20
Track bolts, untreated	8.25
Track bolts, heat treated, to rail- roads	8.50

*Seattle, add 30¢.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	6.10¢
0.81 to 1.05 carbon	8.05¢
1.06 to 1.35 carbon	10.35¢

Worcester, add 0.30¢.

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa.	26.50	
Washington, Pa.	26.50	22.50
Claymont, Del.	26.50	
Conshohocken, Pa.		22.50
Nickel-carbon		
10 pct, Coatesville	27.50	
Inconel-carbon		
10 pct Coatesville	36.00	
Monel-carbon		
10 pct, Coatesville	29.00	
No. 302 Stainless-copper- stainless, Carnegie, Pa.		75.00
Aluminized steel sheets		
Hot dip, Butler, Pa.		7.75

*Includes annealing and pickling, or sandblasting.

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	94, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	103 122
Galvanized nails*	103 122
Woven wire fence†	109 132
Fence posts, carloadst††	112
Single loop bale ties	106 130
Galvanized barbed wire**	123 143
Twisted barless wire	123

*Fgh., Chl., Duluth; Worcester, 6 columns higher. †15½ gage and heavier.
**On 80 rod spools, in carloads. ††Duluth, Joliet and Johnstown.

	Base per 100 lb	Pittsburg, Calif.
Annealed fence wire†	\$4.80	\$5.75
Annealed, galv. fencing†	5.25	6.20
Cut nails, carloadst††	6.75	

†Add 30¢ at Worcester; 10¢ at Sparrows Pt.
††Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dyn- alloy	Hi Steel	Mayari R	Otis- coloy	Yaloy	NAX High Tensile
Producer	Republic	Carnegie- Illinois, Republic Sharon*	Republic	Alan Wood	Inland	Bethle- ham	Jones & Laughlin	Youngs- town Sheet & Tube	Great Lakes Sharon*
Plates	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.20	5.45
Sheets									
Hot-rolled	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.15
Cold-rolled	6.05	6.05	6.05		6.05	6.05	6.05	6.05	6.25
Galvanized		6.75				6.75			
Strip									
Hot-rolled	4.95	4.95	4.95		4.95	4.95	4.95	4.95	5.15
Cold-rolled			6.05			6.05	6.05	6.05	6.25
Shapes		4.95			4.95	5.05	4.95	4.95	
Bars									
Hot-rolled	5.10	5.10	5.10		5.10	5.10	5.10	5.10	5.30
Bar shapes		5.10			5.10	5.10	5.10	5.10	

* Sheets and strip.

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15c to base price except
Cincinnati and New Orleans (*), add 10c; New York, add 20c.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4815 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.38	5.42	6.18	....	9.60-10.10	....	....
Birmingham	5.00	....	6.40	5.00	....	5.15	5.00	5.10	6.57	....	....	....	....
Beaton	5.55	6.45-6.75	7.11-7.61	5.60-5.95	6.75	5.80	5.42	5.52	6.27	9.67-9.79	10.04-10.07	11.23	11.47
Buffalo	4.85	5.75	7.42-7.57	5.24	7.27	5.35	5.00	4.95	5.40	9.30	9.60	10.65	10.95
Chicago	4.85	5.75	6.85	4.85	5.45-6.15	5.10	4.90	4.90	5.40	8.90	9.26	10.25	10.55
Cincinnati*	5.16-5.51	5.84-6.28	6.99-6.93	5.28-5.43	....	5.33-5.85	5.33	5.33-5.48	6.08-6.20	9.74	9.99	11.19	11.44
Cleveland	4.85	5.75	6.70	5.02	....	5.21	5.01	5.01	5.45	9.05	9.35	10.40	10.70
Detroit	5.28-5.32	6.07-6.16	7.38-7.58	5.27-5.47	6.27-6.58	5.52-5.57	5.33	5.33-5.55	6.00-6.18	9.67	9.92	11.11	11.35
Houston	6.70-6.95	....	7.30	6.70	....	6.70	6.20	6.40-6.79	7.60	10.45	10.40	11.45	11.70
Indianapolis	5.29	6.13	7.44	5.29	7.36	5.54	5.31	5.34	6.14	11.25	11.39	....	....
Kansas City	5.45	6.35	7.40-7.45	5.45	6.05-6.90 ²	5.70	5.50	5.50	6.05	9.50	8.30	10.65	9.65
Los Angeles	6.45	7.90	7.45	6.65	7.35 ²⁰	6.15	5.95	6.10	7.95 ¹⁴	10.95 ¹⁵	10.90 ¹⁵	12.45 ¹⁵	12.70 ¹⁵
Memphis	5.75	6.60	7.20	5.80-5.95	6.80	5.95	5.75	5.75	6.53	....	....	....	....
Milwaukee	5.03	5.93	7.02	5.03-5.38	6.32	5.28	5.08	5.08	5.63	9.53	9.73	10.98	11.23
New Orleans*	5.95	6.75	....	6.15	....	6.15	5.95	5.95	6.65 ⁸	....	....	....	....
New York	5.40	6.31	6.85-6.90	5.62	6.78	5.65	5.33	5.57	6.31	9.28	9.58	10.63	10.93
Norfolk	6.00	....	....	6.20	....	6.05	6.05	6.05	7.85	....	....	....	....
Omaha	6.13	....	8.33	6.13	....	6.39	6.19	6.18	6.98	....	....	....	....
Philadelphia	5.05	6.24 ¹³	6.58	5.40	6.29	5.35	5.10	5.40	5.94	9.05	9.35	10.62	10.87
Pittsburgh	4.85	5.75	6.90	5.00	6.00	5.05	4.90	4.90	5.40	8.90	9.20	10.25	10.55
Portland	6.50 ⁸ -7.05	6.00	8.80-9.10	6.85 ⁸	....	6.30 ⁸	6.35 ⁸	6.35 ⁸	8.25 ¹⁴	10.50 ⁶	10.10 ⁶	....	....
Salt Lake City	7.05	7.05	8.65	7.45 ³	....	5.65 ³	5.50 ³	7.10 ⁸	8.15	....	....	....	....
San Francisco	6.15 ⁸	7.50 ²	7.80	6.75 ⁸	8.25 ³	6.35 ⁸	5.90 ⁸	5.90 ⁸	7.55	10.90 ¹⁵	10.85 ¹⁵	12.40 ¹⁵	12.65 ¹⁵
Seattle	6.70 ⁴ -7.10	8.15 ² -8.68	8.80-9.30	6.70 ⁴	....	6.35 ⁴	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
St. Louis	5.22-5.37	6.12-6.27	7.32	5.22	6.68-7.54	5.47	5.27	5.27	5.82	9.27-9.72	9.67-9.97	10.82-11.17	10.92-11.42
St. Paul	5.44	6.19-6.34	7.54-7.64	5.44	6.62	5.64-6.69	5.49	5.49	6.84	9.49	9.79	10.84	11.14

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1499 lb strip, extras on all quantities. Bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 3000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3000 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb; (20) 6000 lb and over.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 5 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	....	....	....	....
Birmingham	38.88	39.38	....	....	....
Buffalo	46.00	46.50	47.00	....	....
Chicago	46.00	46.50	46.50	47.00	....
Cleveland	46.00	46.50	46.50	47.00	51.00
Duluth	46.00	46.50	46.50	47.00	....
Erie	46.00	46.50	46.50	47.00	....
Everett	46.00	50.00	50.50	....	....
Granite City	47.90	48.40	48.90	....	....
Ironton, Utah	46.00	46.50	....	....	....
Lone Star, Texas	46.00	46.50	....	....	....
Neville Island	46.00	46.50	46.50	....	....
Geneva, Utah	46.00	46.50	....	....	....
Sharpville	46.00	46.50	46.50	47.00	....
Steeltown	46.00	46.50	46.50	47.00	....
Struthers, Ohio	46.00	46.50	46.50	47.00	54.00
Svealand	46.00	46.50	46.50	47.00	....
Toldeo	46.00	46.50	46.50	47.00	....
Troy, N. Y.	46.00	46.50	46.50	47.00	54.00
Youngstown	46.00	46.50	46.50	47.00	....

DELIVERED PRICES (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	\$0.50 Arb.	....	50.00	50.50	....	....
Beaton	Steeltown	6.27	54.27	54.77	55.27	55.77	60.27
Brooklyn	Steeltown	5.48	....	33.98	34.48	34.98	59.48
Cincinnati	Birmingham	6.09	44.97	45.47	....	....	....
Jersey City	Steeltown	3.67	....	52.17	52.67	53.17	57.67
Los Angeles	Geneva-Ironton	7.13	53.13	53.63	....	....	....
Mansfield	Cleveland-Toledo	3.03	59.03	59.53	49.53	50.03	54.03
Philadelphia	Bethlehem	2.17	50.17	50.67	51.17	51.67	56.17
Philadelphia	Svealand	1.31	49.31	49.81	50.31	50.81	55.31
Philadelphia	Steeltown	2.81	50.81	51.31	51.81	52.31	56.81
San Francisco	Geneva-Ironton	7.13	53.13	53.63	....	....	....
Seattle	Geneva-Ironton	7.13	53.13	53.63	....	....	....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	....	....
Gulf Ports	Lone Star, Texas	....	50.50	51.00	....	....	....

† Low Phos., Southern Grade.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 30c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 0.01 to 0.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$59.50; f.o.b. Buffalo, \$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Westland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$175
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerton, Pa.	\$64.00 \$65.00
Pgh. or Chicago	65.00 66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C, 7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	18.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
(65-72% Cr, 2% max. Si)	
0.06% C	28.75
0.10% C	28.25
0.15% C	28.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-69% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots.	
97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CM5Z

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11% Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferrealloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovandium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primus)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ , contract basis, per pound contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	9¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa., per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.25
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N.Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads per net ton	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.40¢
Ton lots	8.80¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Ton lots, packed, lump	11.75¢
Less ton lots, lump	12.25¢
Boron Agents	
Contract prices, per lb of alloy, del.	
Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lot	\$1.20
F.o.b. Wash., Pa.; 100 lb and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silicaz, contract basis, delivered	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	97¢
No. 6	63¢
No. 79	46¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	9.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$4.25

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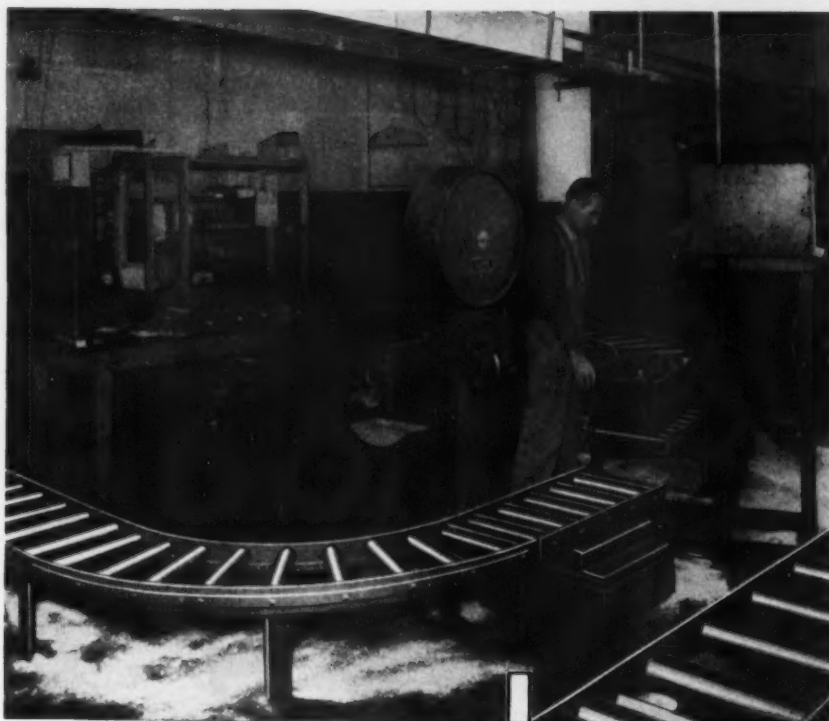
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move...*

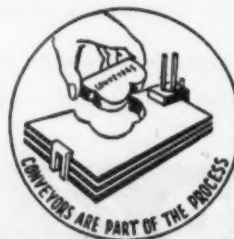
Power-operated Logan Pan Lift raises tote pans of nuts and bolts from low level Roller Conveyor lines in foreground to higher line in the background. Pans are raised after weighing, and the rear line passes the material on to storage.

Many authorities agree that "moving is 40% to 70% of making." What is *your* percentage?

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Dear Editor

Letters From Our Readers

MORE READERS' REACTIONS ON THE NEW FORMAT

(Below are more letters from our readers commenting on the new format which was initiated with the Aug 4 issue. The reactions are: 83 pct in favor, 5 pct no comment, and 12 pct against.—Ed.)

Sir,

We have noted the obvious changes in the Aug. 4 issue and we feel they are all for the better. Nowadays, when time is an important factor, the brevity, readability and method of presentation will, we believe, all add up in favor of IRON AGE.

E. E. MOORE

Vice-president

Carnegie-Illinois Steel Corp.
Pittsburgh

Sir,

The changes in format and its ease in reading are certainly changes for the better. The ease in reading is especially noticeable in the Newsfront.

ANTON L. SCHAEFFLER
Metallurgical Engineer

Arcos Corp.
Philadelphia

Sir,

Undoubtedly, the index as shown in the new issue is an improvement, but I think frankly that this has been, insofar as I am personally concerned, nullified by the procedure of spreading the articles all over the book.

RALPH T. ROWLES
Jones & Laughlin Steel Corp.
Pittsburgh

Sir,

You are to be complimented on the new get-up. The ease with which the various articles can be located is a vast improvement. The IRON AGE is now more readable and interesting.

F. C. HARDIE

Pittsburgh

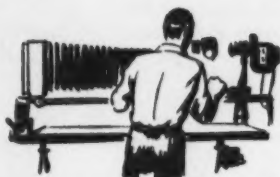
Sir,

I have read with interest and wish to compliment you and your associates

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TAKE ADVANTAGE OF THESE VALUABLE ARCOS SERVICES



Laboratory Research



Quality Control



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Technical Information

ELECTRODES • COILED WIRE • BARE ROD

In our long association with stainless fabricators, we have learned that their first and last interest in electrodes is the production of sound weld metal. Arc characteristics, ease of slag removal, bead appearance are all plus qualities easily evaluated but sound welds on every job and from every pound of electrodes is vital to the user's reputation.

We have further learned, as manufacturers, that stainless electrodes of a quality which will produce sound weld metal *all the time* are achieved only through a considerable expenditure of technical skill in testing and retesting. Arcos electrodes which do not produce trouble-free welds under our strict quality control tests are rejected *before they reach our warehouse*. This extensive care to produce trouble-free electrodes is reflected in the price of Arcos electrodes.

The extensive care in the Arcos processing of electrodes costs more than conventional methods used in the manufacture of low priced steel electrodes but it pays out when it eliminates the costs of chipping and rewelding or failure in service.

The best informed buyers of stainless electrodes specify Arcos.



OUT OUR WAY



You Can't Beat the Facts!

New improved SOL-SPEEDI-DRI gives you more volume per pound.

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YES, the new improved Sol-Speedi-Dri is more economical to use, because you get more bulk, more coverage, more absorption per pound.



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DEAR EDITOR

Continued

on the excellent way you have prepared the new IRON AGE.

H. G. COFFEY

Vice-president
Aetna-Standard Engineering Co.
Youngstown

Sir,

I have read with much interest the Aug. 4 issue and congratulate you and your associates on a job well done. I believe the new arrangement is excellent and feel that the news items and technical articles will always be interesting to those of us who are IRON AGE readers.

BENJAMIN F. FAIRLESS
President

U. S. Steel Corp.
Pittsburgh

Sir,

I have looked through the new issue and frankly I was horrified at the way you have chopped up your editorial material. How many readers refer back to the index, and I imagine that has slowed up readability of the magazine. However, I still think that your editorial material is head and shoulders above all others.

BENJAMIN W. CORRADO
Publisher Industries Inc.
Philadelphia

Sir,

At quick glance, it looks fine to me and I feel sure that future changes will be consistently for the better.

C. M. WHITE
President

Republic Steel Corp.
Cleveland

Sir,

Congratulations on the way you have changed the IRON AGE. It is now far more readable and interesting because of the ease in locating technical articles and news columns.

LEWIS M. PARSONS
Washington

Sir,

Congratulations. The new techniques are much better. The whole thing is progressive as, of course, IRON AGE generally is. I have only one suggestion and that is that more writer's pictures be used.

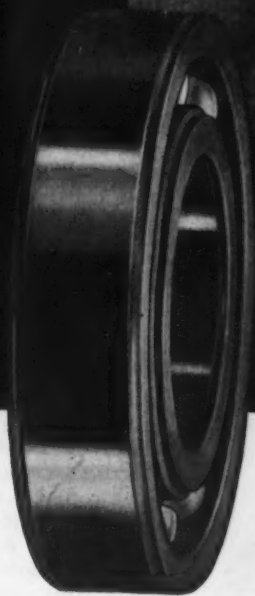
PAUL THIXTON
U. S. Steel Corp.
Chicago

Sir,

Although I am very busy, I can always find the time to give credit where due, and credit is certainly due you for the way you have improved the presentation of articles in the new

Nothing Rolls Like a Ball

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September 1, 1949



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DEAR EDITOR

Continued

IRON AGE. We often refer back to articles in your magazine for authoritative opinions. Keep up the good work.

AMOS BOWMAN
Vice-president

Luria Bros. & Co., Inc.
Pittsburgh

Sir,

Although I do not like the modernized format, I am relieved to know that the technical papers remain full, complete and authoritative.

LAMAR KELLEY
Allegheny Ludlum Steel Corp.
Pittsburgh

Sir,

The new look is a genuine improvement. It helps tremendously to have the news material better oriented so that all the articles of special interest may be easily found.

WARREN SEELY
Warner & Swasey Co.
Cleveland

Sir,

You have done what I had hoped would have been done long ago when you moved the index to p 2. This page is extremely helpful and I am sure will prove acceptable to your readers. The overall change of format is also a definite improvement. Keep up the good work.

PAUL SULLIVAN
Geneva Steel Co.
Salt Lake City

Sir,

Congratulations on your progressive steps in magazine publishing. There is no question about it, the use of p 2 and 3 for such basic information as the table of contents and staff members, is a great improvement. The judicious use of color to illustrate the various sectional heads contributes to fine layout and attractive presentation. Also it is nice to know what the fellow who reports the news looks like.

A. J. JOHN
Kearney & Trecker Corp.
Milwaukee

Sir,

Certainly the layout and arrangement of the new IRON AGE is entirely different and I think on the whole a distinct improvement. I will admit that at first it was somewhat startling for one used to the old setup. Unquestionably, it will be much easier to locate the various sections and articles of interest. The placing of the news section up front gives the magazine a much livelier appearance.

R. A. REED
Worcester
Norton Co.

Gas Pipeline Authorizations Total Over 7000 Miles for '48

Washington—A total of 7045 miles of natural gas pipeline construction was authorized during the fiscal year ending June 30, according to the report of the Federal Power Commission.

More than two thirds, or 4900 miles, of construction has been approved since Jan. 1 when steel pipe supplies became more available.

Since the present certificate provisions of the Natural Gas Act became effective in February 1942 the FPC said, it has authorized a total of 27,500 miles of construction plus 1.6 million hp in compressor units at an estimated expenditure of more than \$1.6 billion.

Largest single authorization during the past 6 months was for construction by the Trunkline Gas Supply Co. of 711 miles of 26-in. line from Texas to Nebraska together with 810 miles of connecting lines at an estimated cost of nearly \$85 million.

Another large project was for 506 miles of 34-in. line to connect facilities of the Pacific Gas & Electric Co., in Santa Clara County, Calif., with El Paso Natural Gas Co., at the Arizona border.

Will Survey Thailand Minerals

Washington — Three American geologists, to be recruited by the Interior Dept., will leave sometime in September to assist Thailand (formerly Siam) geologists in making a survey of that country's mineral resources.

Work will be largely confined to surveying districts where principal mineral deposits are located and one expected result of the assistance, according to the State Dept., is an expansion of variety and quantity of imports to this country from Thailand.

Work is expected to be completed by next April. State will pay transportation costs and Thailand will pay expenses while there.

MODERNIZATION

Demands...



G-E Motor Control Centers

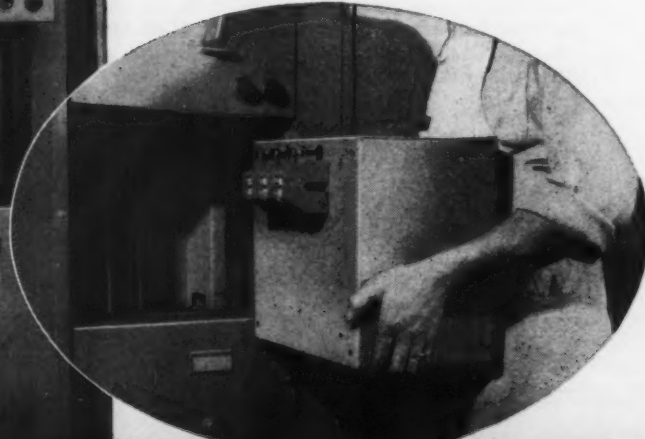
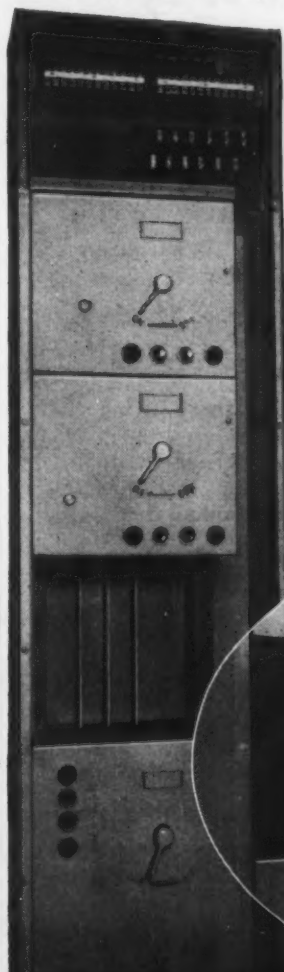
for EASY, LOW-COST INSTALLATION

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SIMPLIFIED SERVICING

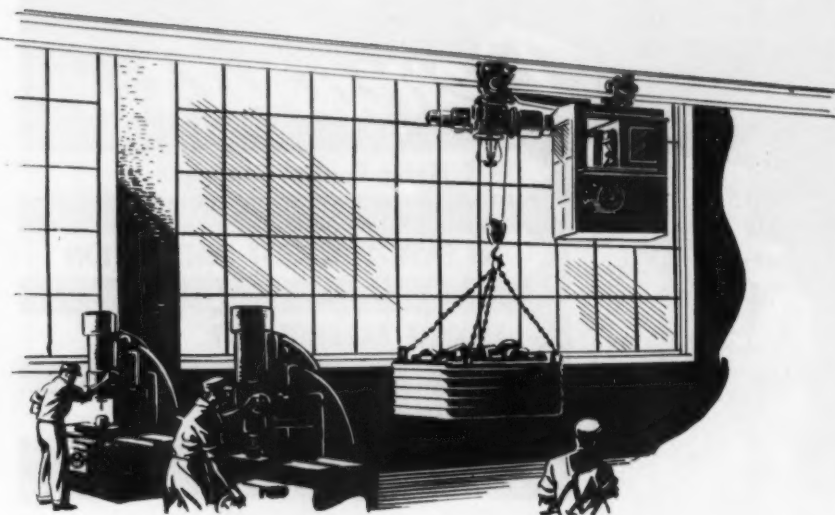
These advantages, plus many more, are yours when you buy economical, G-E motor control centers. Only 12 inches deep, front connected, pre-engineered, can be factory assembled, wired, and tested. Individual sections can hold combinations of two or more sizes of starter units. (NEMA Size 1, 2, 3, and 4 for 1 to 100-hp a-c motors, 440 volts or below). Standard starters in standard vertical sections simplify installation, servicing, and stocking spare parts, yet permit flexible arrangements.

In addition, each unit is "wrapped in steel," has built-in short-circuit and overload protection. Wiring troughs are five inches wide, terminal and incoming bus may be at top or bottom as you prefer—all easily accessible. Wiring time is cut because "clothes-pin contacts" (below) connect to incoming power in one quick shove. Write now for more details in Bulletin GEA-4979. Apparatus Department, General Electric Company, Schenectady 5, N. Y.



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• News of Industry •

Refrigerator Sales to Brazil Limited by Trading Handicaps

Domestic refrigerators needed but delivered prices are still too high

Washington—If United States distributors could find a way to ease trading handicaps such as strict import licensing and relatively high delivery costs, a land office business might be done in selling domestic type refrigerators in Brazil.

One refrigeration engineer estimates that if deliveries could be made, even at current prices, exporters could find an immediate market for more than 50,000 units—a third of them in the Sao Paulo area alone.

Brazil is short on domestic type refrigerators. Brazilian production is centered largely upon industrial air conditioning and commercial boxes. Industry has become aware of the need in varied areas for humidity control. Thus, the industrial element outweighs the human factor and few air conditioning elements are found in apartments or business houses such as stores and theaters.

However, stores and restaurants have awakened to the advantages of commercial refrigeration units and there continues to be a better than normal demand for such types. The major portion are manufactured locally with imported compressors and parts and Brazilian-made cabinets.

Demand Exceeds Supply

These commercial units range in size from 15 to 40 cu ft and have been produced in considerable quantities. However, the demand is greater than the supply.

The domestic types are largely gas-fired. There has been talk of at least one firm in the Sao Paulo area making plans to assemble domestic types in quantity—with importation of parts. But in face of present import difficulties this is still nebulous.

As it is, Brazilian production is still too expensive for the average household, even if the supply were

• News of Industry •

plentiful. Retail prices of 7½ cu ft models are around the equivalent of \$600 or more. A small household model produced in the United States to sell around \$225 would be tagged in Brazilian outlets at the equivalent of \$485.

Consulate information indicates that the Bank of Brazil has been considering a more relaxed policy in issuing import licenses for refrigeration equipment. But for the gas-fired types of commercial and industrial equipment, at last reports the bank appeared to be following its former rigid policy.

Hunt Named U. S. Delegate

Detroit—J. H. Hunt, General Motors consulting engineer, has been named a member of the United States delegation to the International Road Transport Conference in Geneva. The conference opened Aug. 23.

Sponsored by the United Nations, the delegates will attempt to stimulate the use of privately-owned cars in foreign countries. The conference will consider standard credentials, uniform rules of the road for the world and a standardized system of signals.

Until his retirement about a year ago, Mr. Hunt was head of the new devices section of General Motors Corp.

To Study Cost Reduction

Chicago—The 1949 Fall Training Conference on Time and Motion Study, under auspices of the Society for the Advancement of Management will be held Oct. 13-14. All sessions will be conducted at the Illinois Institute of Technology. Chairman of the conference is H. A. Mercer, chief industrial engineer of Sterling Tool Products Co., Melrose Park, Ill.

Keynote of the conference will be reduction in costs through utilization of new developments and principles of industrial engineering. In view of current business conditions, cost reduction is of paramount importance.

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• **News of Industry** •

**Canadian Steel Demand
Shows Signs of Falling Off**

Toronto—New business is appearing at a good pace in the Canadian steel market. But there are signs which point to some falling off in demand later this year. Although Canadian mills have been doling out supplies on a quota basis, it is understood that bookings for the last quarter won't be restricted as to tonnage. Still there is a possibility that all orders may not be filled.

Much of the improvement in the steel supply situation here is due to larger imports from the United States. With the possible exception of galvanized sheets, which are still in tight supply, these imports have taken the pressure off most steel items. As a result many smaller consumers have returned to a policy of spot buying. They don't appear to be greatly concerned over the future.

Although imports have helped bring supply and demand into balance, some buyers are paying higher prices for imported steel. This is true because they are unable to obtain their full requirements from Canadian mills. But this condition is expected to change within the next 2 or 3 months. Domestic producers can be expected to take care of a larger percentage of Canadian needs.

Meanwhile, Canadian mills are operating at virtual capacity and there have been no indications of a cut in mill operations.

Buick Production Up 46 Pct

Flint—With its lowest priced model out of production, Buick Motor Div. of General Motors assembled 46 pct more cars during the first 7 months of the year than were built during the same period last year.

According to Ivan L. Wiles, Buick general manager, cars turned out so far this year numbered 234,127.

Buick reports that about 22,000 Dynaflo automatic transmissions were built during July.

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• News of Industry •

Westinghouse Scientists Probe Mysteries Close to Absolute Zero

Pittsburgh—Westinghouse Electric Corp. is the source of a couple of hot weather stories. Its scientists are probing deeper into the mystery of how matter behaves at temperatures a fraction above the world's coldest cold — absolute zero.

Dr. Aaron Wexler, head of low-temperature studies at the Westinghouse Research Laboratories, discloses that a new "cryogenics" laboratory is producing custom-made temperatures all the way down to 458 degrees below zero Fahrenheit. Using special techniques, the scientist can come within one-tenth of a degree of absolute zero, which is 459.7 degrees below zero on the Fahrenheit scale.

"At such temperatures," Dr. Wexler explains, "the nature of matter undergoes radical changes and behaves in a most mysterious manner. For example, liquid helium flows uphill and the flow of electricity in a wire encounters no resistance at all. Although these facts have been known for years, scientists are striving to find out why this should happen.

"This strange behavior, which scientists call 'super-conductivity,' may be of great significance to future power transmission. If it could be properly harnessed, it might mean much more efficient and cheaper distribution of electricity. A thorough understanding of the nature of super-conductivity may be the key to unlock this door."

Follansbee Net Down Sharply

Pittsburgh — Follansbee Steel Corp. reported for the first half of 1949 a profit of \$259,418, or 58¢ per share on sales of \$15,191,074. This compares with \$1,584,733, or \$3.58 per share on sales of \$17,724,728 for the first half of 1948.

For the second quarter of 1949 the corporation sustained a net loss of \$202,151 on sales of \$6,341,840. For the second quarter of 1948 the net profit was \$973,428 on sales of \$10,381,964.

For those WHO BUY OR SPECIFY
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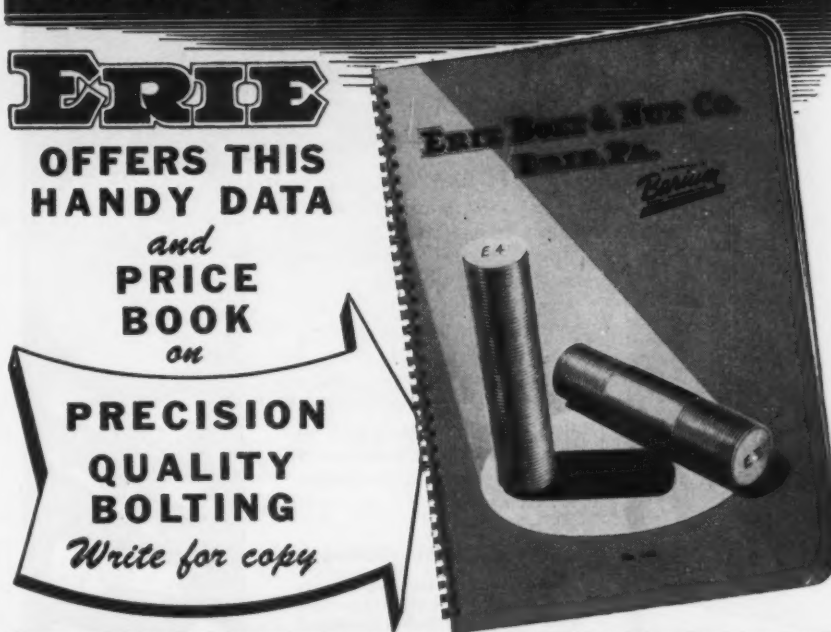
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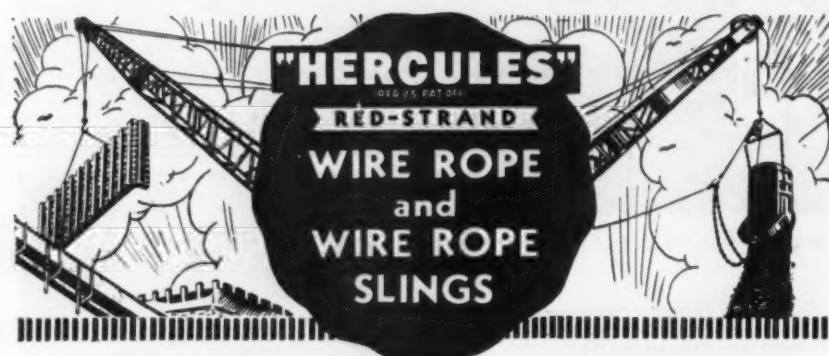
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• News of Industry •

New Pressure Chamber Will Test Navy Submarine Equipment

Baltimore—At the Naval Ordnance Laboratory near White Oak, Md., a pressure chamber of unique and ingenious features was recently completed. It will be used to conduct experiments with submarine equipment under conditions resembling those at considerable ocean depths.

In the cylindrical chamber, which is 30 ft long and has an inside diameter of 100 in., pressures up to 1000 psi are developed. This is equal to pressure at 2000 ft or more below the ocean surface.

The body of the vessel, a metal shell of high-strength steel 3 5/16 in. thick, was built by Babcock & Wilcox Co. to Navy specifications. It was subjected to heat treatment for relief of possible welding stresses, X-ray examination to insure against faults, and various tests in the presence of Navy officers.

Lowering and raising of the 78,000-lb door is accomplished by a hydraulic lift actuated by push-button control and automatic relays, which operate the door safety locks and hydraulic system through a pre-set cycle.

Suspends Exporters License

Washington — The Commerce Dept. announced recently that it had suspended for the duration of export controls, all license privileges of the Belimex Corp., New York exporting firm.

This action was taken, according to OIT, because the firm had contracted to sell some \$200,000 worth of ball bearings to a Czechoslovakian concern but represented to OIT that the ultimate destination and use were Belgian factories.

Included under the suspension order were Bernard Liebermann, Belimex owner, and Mrs. Julia Cohn, manager of the New York office. While the firm and Liebermann are under absolute suspension, Mrs. Cohn may apply to have her suspension lifted after 1 year.

FATIGUE CRACKS

Continued from page 20

charge in a blast furnace, but along with 60 pct swarf the Hungarians seem to love it like goulash.

Just in case you want to try a little international seasoning on your purchasing agent, walk in and ask him "What are the Iron Age prices on swarf this week?" Ten will get you one that for the first time in your life you'll see the p.a. completely baffled.

Lost Weekend

In looking over the list of general science societies associated with the American Association for the Advancement of Science, we note the following at the tail of the list: Research Council on Problems of Alcohol, Wilderness Society, Wildlife Society. Nos. 1 and 3, we assume, work together closely.

Bow-wow

The new dog catcher for New Brunswick, N. J., we are gratified to learn, is a woman—one Mrs. Tess Daddio, 36, and not bad looking.

The appointment has far reaching implications. For one thing, there will have to be a realignment of the phrase, denoting utmost political scorn, "I wouldn't vote for him for dog catcher."

With Mrs. Daddio on the job, the position takes on a new dignity, and deserves all the gallantry accorded the weaker sex. Perhaps some of the glamor now associated with that other Jersey town, Atlantic City, will rub off and we will find Miss Laramie or Miss Cedar Rapids returning from beauty trials to stand for election as dog warden.

In the publishing field, the boys say, "I wouldn't have him as circulation manager," which is about as low as you can go. Of course this phrase wouldn't do as a general currency, and the politicians will have to find something else . . . but not dog catcher.

If you're bothered by the vision of Mrs. Daddio chasing Fido in high heels, you'll be relieved to learn that she doesn't wear them on the job. Even though she is only 36, she has two daughters, 22 and 20, which would seem to indicate that she got an early start in life. Applying the same determination of purpose, she will probably be up and on the job early, and if any of our New Brunswick subscribers, like Triangle Conduit or New Brunswick Tool & Die, keep any dogs they might just as well buy tags now if they haven't already.

Resume your reading on page 21



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For clean hardening, annealing, normalizing, carburizing, Ni-Carbing, etc., of many small parts.

The self-metering feed hopper arrangement permits the operator to pre load a one-half hour charge of work which is then continuously and uniformly processed without further attention, thereby eliminating costly man-hours. If desired, a continuous feeding mechanism may be employed which completely eliminates the need for an operator.

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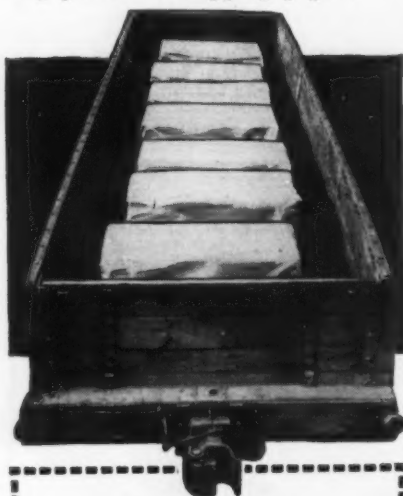
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Iron Age
Introduces

Continued from Page 110

Ernest P. Keller, Jr., has been named general manager and member of the board of directors of WOOD BROS., INC., a subsidiary of Dearborn Motors, Detroit. He had formerly been associated with Reo and Nash-Kelvinator.

John J. Doyle has been elected manager of electronic tube sales, Lamp Div., WESTINGHOUSE ELECTRIC CORP., Bloomfield, N. J., succeeding Adolph Frankel, who was recently named manager of the Northwestern District of the Lamp Div.

William H. Corwin has been appointed public relations director of TAYLOR INSTRUMENT COS. Since 1943 he had edited the company's publication, "The Taylor Meteor."

H. E. Crawford has been named assistant general sales manager of CHEVROLET MOTOR DIVISION in charge of the western half of the United States. Ivan X. Sarvis has been assigned to sales in the eastern half of the country.

Hayward F. York has been named assistant plant engineer of PLYMOUTH MOTOR CORP., Detroit.

Robert J. Robillard has been made chief of advanced styling by KAISER-FRAZER CORP., Willow Run, Mich. He was previously associated with Chrysler Corp., Detroit.

A. G. Hobson has been appointed exclusive representative for CLAUDE B. SCHNEIBLE CO., Detroit. Ray H. Moore has joined the company as a special consultant.

E. R. Traxler has risen to manager of the new flat belting field engineering and development department, B. F. GOODRICH CO.'s industrial products division.

E. W. "Ted" Chapman and S. N. Morison, veteran salesmen of S. G. TAYLOR CO., Hammond, Ind., have been promoted to the positions of, respectively, assistant sales manager and manager of industrial sales.

Russell W. Knode has been made assistant manager of the export division of JEFFREY MFG. CO., Columbus, Ohio. Clark Allen is replacing

Greater Tonnage
Per Edge of Blade

AMERICAN
SHEAR KNIFE CO.
HOMESTEAD - PENNSYLVANIA

IRON AGE INTRODUCES

Continued

E. F. Abram, who has retired as head of the pricing department. F. E. McGovern, formerly of coal preparation engineering, has been transferred to coal preparation sales. Henry W. Nau has replaced Mr. McGovern in the engineering division. H. C. Rockwell, who has served as district manager of the Baltimore office of the company, has returned to the product sales division at the home office. J. R. Brisley, who has been working out of Philadelphia, has been appointed district manager at Baltimore. Charles E. Lawall, Jr., has been assigned to the Philadelphia office.

Donald B. White has been named district manager of GENERAL ELECTRIC SUPPLY CORP., Buffalo, to succeed the late Robert D. Glennie.

W. O. Bechman has been appointed chief engineer, advanced engineering group, in INTERNATIONAL HARVESTER CO.'s Power Division. M. R. Bennett has been named chief engineer, product engineering group; H. V. Parsley is chief engineer, government engineering group; J. W. Curley becomes chief engineer, experimental and test group. The reorganized functions of industrial power engineering at the company will be directed by D. B. Baker, manager of engineering.

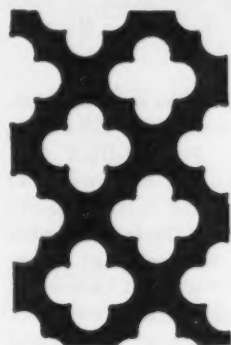
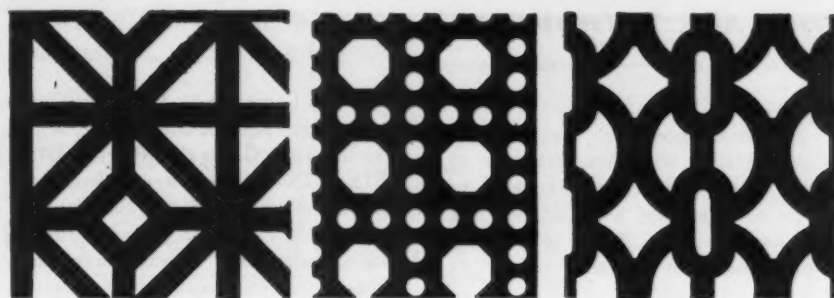
Martin R. King has been promoted to the post of manager of the GENERAL ELECTRIC APPARATUS DEPARTMENT NEWS BUREAU, Schenectady, N. Y.

Howard H. Weber is the new general sales manager of the wire and cable department, U. S. RUBBER CO., New York.

Homer C. Lackey has been made sales manager of the Chicago-St. Louis-Houston district for THE MIDVALE CO., Philadelphia, with headquarters in Chicago.

W. H. "Tye" Moffatt has been appointed field representative for THE UDYLITE CORP., Rochester, N. Y. During the past year, he has represented Udyllite as sales and service engineer for New York State.

James Hoxie, factory superintendent of OLIVER UNITED FILTERS, Oakland, Calif., has been made assistant plant manager of the company's Hazleton, Pa. factory. Graham Lee, assistant plant manager



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Hendrick offers a wide variety of decorative patterns in light weight, perforated metal, for radiator enclosures, stove panels, kitchen cabinets, and similar applications.

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Tipped) Cutters come in cased sets for tool rooms and maintenance departments, and individually in all sizes for general machine shop and production turning. They permit not only the ready machining of sand-filled castings, the hardest and toughest steels as well as many heretofore "unmachineable" materials, but also make practical much heavier cuts and cutting speeds up to 600 f.p.m. on ordinary work. They also run from 10 to 100 times as long between regrindings.

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IRON AGE INTRODUCES

Continued

at Hazleton, goes to the Eastern Sales Division with headquarters in New York. Clarence Hansen, in charge of Planning at Oakland, has been assigned the duties of acting superintendent at Oakland.

Robert H. Davies recently joined THE BAKER-RAULANG CO., Cleveland as manager of engineering, in which capacity he will have supervision of all engineering functions for the company. He was previously associated with Lockheed Aircraft Corp. and with The Permanente Metals Corp.

Samuel Spilka has been promoted to the position of secretary-treasurer of TELAUTOGRAPH CORP., New York.

Peter M. Reif has recently joined the Mechanical Engineering Department of HORIZONS INC., Princeton, N. J.

George T. Ladd has been appointed production engineer of FAIRCHILD ENGINE & AIRPLANE CORP., Hagerston, Md. Howard W. Crusey has been made sales engineer. Both men

have joined the Al-Fin Division of the corporation.

W. L. Larson has been appointed division manager of the Wayne, Mich., division of GAR WOOD INDUSTRIES, INC. Mr. Larson had been division manager of the St. Paul division in Minneapolis, previous to his new appointment. Frank Hasselman, formerly sales manager of the St. Paul division, has been made St. Paul division manager, succeeding Mr. Larson.

M. K. Brintlinger has been appointed district manager at Columbus, Ohio, for the A. F. HOLDEN CO., New Haven, Conn. C. R. Brown has been appointed in the same capacity at New Haven; R. B. Durfee at Skaneateles, N. Y., C. R. Hecker at Plainfield, N. J., H. A. Moffat, at Lakewood, Ohio, J. P. Shotland, at New York City, R. L. Stephensen, at Detroit and J. W. Van Scoter, at Chicago. These men had previously served the Holden Co. as field engineers.

Don Connors is New York sales manager of KERRIGAN IRON WORKS, INC., Nashville, Tennessee. Mr. Connors has had over 30 years of steel industry experience.

R. D. Jablonsky succeeds the late W. C. Roederer as district manager at the St. Charles, Mo. plant of AMERICAN CAR & FOUNDRY CO. During the war Mr. Jablonsky served as general foreman at Curtiss-Wright Corp., St. Louis.

George E. Gilliam will manage pyrometer supplies sales nationally for the Brown Instruments Division of MINNEAPOLIS - HONEYWELL REGULATOR CO.

Glen W. Victory has been promoted as manager of purchasing for the Television Picture Tube Division of SYLVANIA ELECTRIC PRODUCTS, INC., New York.

Albert F. Sutts has joined WABASH SCRAP MATERIAL CO., Toledo, Ohio, as general manager of their non-ferrous department. He worked formerly for the Toledo Smelting & Refining Co.

Richard H. Marshall, formerly production metallurgist of Timken Roller Bearing Co., has joined the metallurgical staff of CLIMAX MOLYBDENUM CO., Chicago.

OBITUARY

Thomas P. Archer, vice-president of GENERAL MOTORS CORP., died August 10.

Richard E. Cruickshank, 50, executive secretary of VERMONT STATE BUILDING COUNCIL, died Aug. 16.

George L. Parmenter, 66, vice-president, director and assistant treasurer of SIMONDS SAW & STEEL CO., Fitchburg, Mass., until his retirement in March this year, died Aug. 13.

William G. Nee, 40, metallurgist and service engineer of THE FERRO ENGINEERING CO., Cleveland, died Aug. 5.

Philip M. Guba, 62, manager of Eastern Area Sales, CARNEGIE-ILLINOIS STEEL CORP., died Aug. 18.

Alfred Jamieson Miller, chairman of the Board, WHITEHEAD BROTHERS CO., New York, died Aug. 8.

Resume your Reading on Page 24



"What's so good about H-VW-M CLEANERS?"

THOMAS M. RODGERS
H-VW-M Field Representative
Philadelphia Office

"Now there's a man who wants facts," I thought, when a customer popped that question at me. It so happens that of all the H-VW-M items of electroplating and polishing equipment I handle, the "cleaners story" is one of my favorite subjects:

"As we both know," I started, "absolutely clean metallic surfaces are a prerequisite for successful electroplating and anodizing. Poor adhesion, porosity, blisters and other faults in final finishes can usually be traced to inadequate cleaning. In addition, you've got to consider such factors as attack on metals, emulsifying power, electrical conductivity, chemical stability and service life of the cleaning agent.

"No one cleaner can do all jobs equally well," I hastened to point out, "and that is where H-VW-M's long years of experience in solving metal cleaning problems come in. Before recommending a cleaner we analyze pre-cleaning, cleaning and plating operation . . . consider type of materials to be removed after buffing and polishing . . . surface conditions . . . packing in recesses . . . effect of stacking. We also check base metal being used . . . whether D. C. or R. C. is required and whether cleaning operations passive or activate."

For full information on our cleaners, you'll always find a H-VW-M representative ready to recommend the right cleaner for the job . . . or you can write direct to "Headquarters" for Bulletin C-105.

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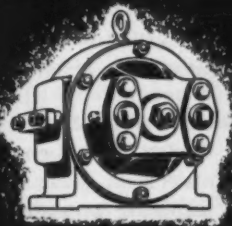
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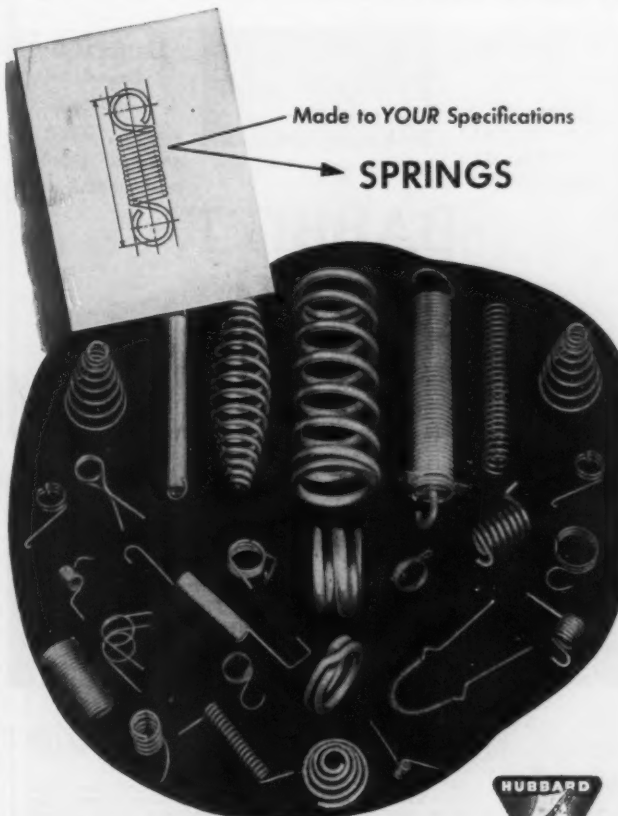
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Continued from Page 28

improvement in the near future.

In Luxembourg the number of operating blast furnaces, which since last November had been held at 25, was reduced to 23 in July. In Belgium seven blast furnaces have been shut down since the first of the year. These curtailments have had their effect on the consumption of coke and iron ore.

Steel Is Pessimistic

Steel circles in these two countries hold a pessimistic view on future prospects from the standpoints of both tonnage and price. Luxembourg has just granted a 5 pct increase in wages, retroactive to July 1. Although there are rumors of an increase in domestic prices, export markets are continuing to skid. Steel leaders are not certain that higher prices on the home market could compensate for the loss of profits previously obtained from exports.

Future policy of the Belgian government will be aimed chiefly at relief of unemployment. Government borrowing is envisaged on an increased scale to finance public works. Thus, the steel industry may benefit from orders for this construction. But the darkest point is the rapidly dimming prospect of foreign markets. Shortages and difficulty of converting currencies are playing their part in restricting trade. Meanwhile, delays in fixing the drawing rights within the framework of the intra-European payment plans have caused uncertainty among European customers.

This situation has confirmed the opinion of those who hammered for more exports when conditions were favorable. In this respect Belgium and Luxembourg have gained valuable ground. Both have greatly strengthened their export position, while their competition must reconquest prewar traditional markets.

Exports Have Helped Benelux

During the past 12 months Belgium and Luxembourg have exported 3,690,000 tons of iron and steel products. Even in recent months the

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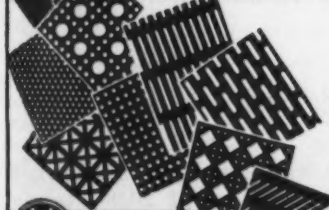
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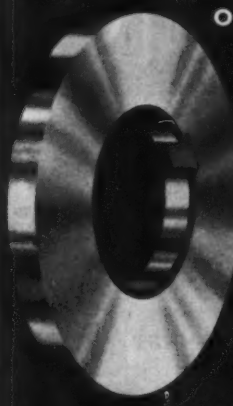
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GLOBAL LETTER

Continued

export level has been maintained fairly well. Pessimism stems from the diminishing rate of new orders booked, rather than from the current rate of export. Even price concessions are not now clinching sales.

Slowing of steel production has not yet caused a serious unemployment problem in the industry. But many workers are now on a part time basis. But the constrictive effect is spreading to other industries depending on steel. Iron ore mines in Luxembourg have been adversely affected by curtailment of blast furnaces. Output of iron ore slipped from 414,188 tons in June to 366,217 tons in July. Exports to Germany, which averaged 37,286 tons per month in 1948, were only 21,924 tons in July. They will now be stabilized at about 20,000 tons a month, according to agreement.

France Signs Trade Pact

Paris — A new trade agreement between France and Greece was signed in Paris Aug. 6, 1949. It provides for export of 20,000 tons of French iron and steel products during the next year. Included in the total are: 10,000 tons of rails, 2950 tons of rolled products, 50 tons of thin sheets, 1000 tons of wire products, 2000 tons of tubes and 4000 tons of cast iron pipe.

Drought Hits French Power

Paris—Unusual drought in France since the beginning of July is causing serious trouble to crops as well as power supply to industry. New measures have been taken to limit the consumption of power. Hydroelectric power is limited by the extremely low level of water in the dams. In the center of the country dams are filled to only 5 pct of their capacity.

Will Increase Sierra Leone Ore Output

Freetown — A report on potential British colonial mineral wealth states that production of iron ore in Sierra Leone is expected to reach 950,000 tons by 1952-53. If expansion measures at Marampa are put into effect output may reach 1,350,000 tons by 1952.

Quantity and quality of Northern Rhodesia ore have not yet been accurately assessed. Development of Malayan deposits, which prewar yielded up to 2 million tons of ore annually, will depend to a large extent on an assured Japanese market.

There is a strong case for increasing production from existing Sierra Leone deposits and developing new ones in that territory.

Resume your reading on page 29

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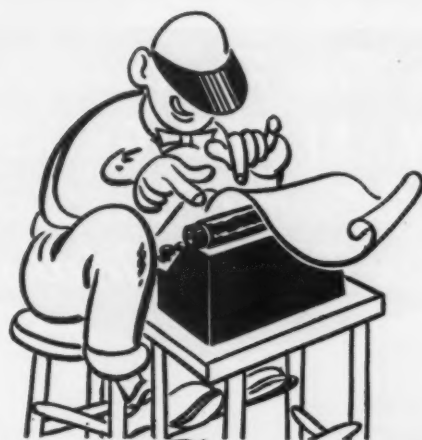
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Dear Customer

by

Jack R. Hight

SLIGHTLY MORE OPTIMISTIC

—We reported in this space in the August 11 issue that there was some reason for modest optimism about the business outlook in the current steel order situation. We warned at that time that we intended to play up this optimistic note as much as possible. It has seemed at times that we were talking ourselves toward a depression, and this column is now taking up the shining sword to attempt singlehanded to talk this great country into a period of new bounteous prosperity.

There are so many signs to indicate that our mid-July upturn in steel demand was the harbinger of generally improved conditions that we hardly know where to start. Our machine tool reporter is noting the signs of an autumn upturn in that field, where pessimism has been particularly rife. The advertising columnist of the *New York World-Telegram* states that in his circles everyone is getting ready to spend a lot of sales promotion money and really go to town selling between now and the end of the year.

There was a lot of mild panic in industry as the war boom finally died. But in most fields industry leaders are discovering that there is still a large reservoir of demand, and that machinery and equipment can be sold to fill that reservoir. But a lot of selling has to be done to get the business.

FUNCTION OF A BUSINESS WEEKLY

—Sometimes it is the job of a weekly in the industrial field to go out and dig up what's developing and lead the way for the general newspapers and magazines. At other times it is our job to overhaul and pin down some classic story on the metalworking industry that has been garbled by the popular press.

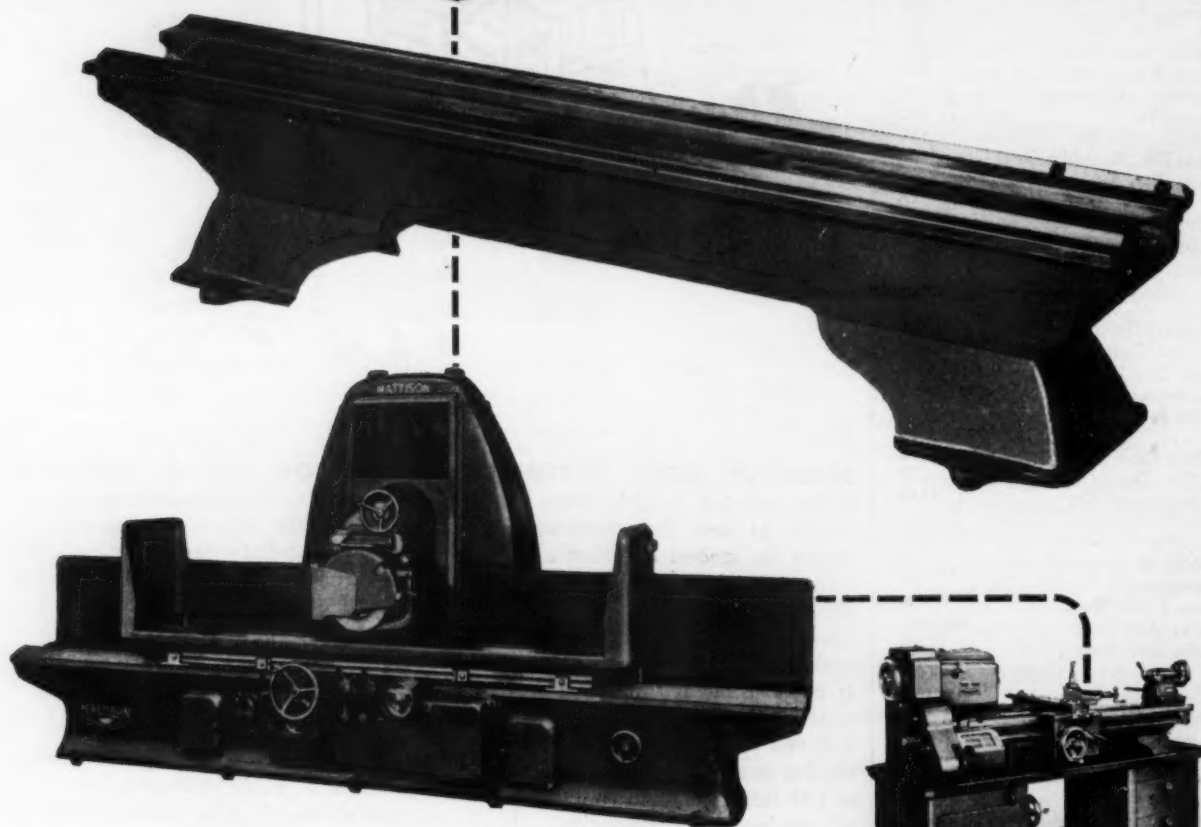
Some months ago there was quite a rhubarb of publicity over a new shaft type of electric blast furnace built in Ohio to use native ores to refine silvery pig iron and foundry iron. The reports were a bit garbled and some approached the fantastic—reminding us of the days when some genius proposed a sponge iron plant at each and every iron mine. This week we lay the dust and come up with a diagram and a description of how the process actually works—the first public presentation of the facts.

FAST FREIGHT INFO—Freight rates go up again today. And first aid for hundreds of purchasing agents who don't have a traffic department at the end of their phones is to be found in the news section of *IRON AGE* this week.

A full page in the news section is devoted to the raises from most of the major steel production areas, to as many steel consuming points as it was possible to get on the page.

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